HITACHI

VT-8500A

SERVICE MANUAL

No. 1422

Technical Data

VIDEO CASSETTE RECORDER

August 1980

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SPECIFICATIONS

Recording	Rotary two head Helical Scan Azimuth Recording
Video	NTSC Color EIA Standard
Cassette	VHS Type
Tape Speed	33.4 mm/sec. (SP mode) 16.7 mm/sec. (LP mode) 11.1 mm/sec. (EP mode)
RF Input	VHF: 75 ohm UHF: 300 ohm
RF Output	Channel 3 or Channel 4
Video Input	0.5~2.0 Vp-p, 75 ohm Unbalanced
Video Output	1.0 Vp-p, 75 ohm Unbalanced
Audio Input	Mic: −66 dB 600 ohm Line: −20 dB 50k ohm
Audio Output	−6 dB 600 ohm
SP Video Recording S/N	Better than 46 dB
LP Video Recording S/N	Better than 43 dB
EP Video Recording S/N	Better than 43 dB
SP Horizontal Resolusion	240 lines
LP Horizontal Resolusion	230 lines
EP Horizontal Resolusion	230 lines
SP Audio Response	50 Hz~10 kHz
LP Audio Response	50 Hz~ 7 kHz
EP Audio Response	100 Hz~6 kHz
SP Audio S/N	Better 43 dB
LP Audio S/N	Better than 40 dB
EP Audio S/N	Better than 40 dB
Power Input	AC 120V 60 Hz
Power Consumption	38W
Cabinet Size	43.5 (W) x 14.5 (H) x 33.0 (D) cm 17-1/8" x 5-11/16" (H) x 13"
Weight	11 kg (24.2 lbs)

FOR CANADA

CAUTION AGAINST FUSE REPLACEMENT

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND SAME RATING FUSE IN ACCORDANCE WITH THE FUSE SYMBOL LAVEL.

The following is indication of the fuse symbol label which is affixed adjacent to the fuse in the equipment.

*Example

This symbol indicates Fast Operating
Type 2A, 250V Fuse.

SAFETY PRECAUTION

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine General Electric replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes. Critical parts are marked with ⚠ in the schematic diagram, and circuit board diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

DISASSEMBLY

1. Top Panel

1) Open the timer pre-set cover and cassette compartment.
2) ① 4 screws. (Fig. 1)

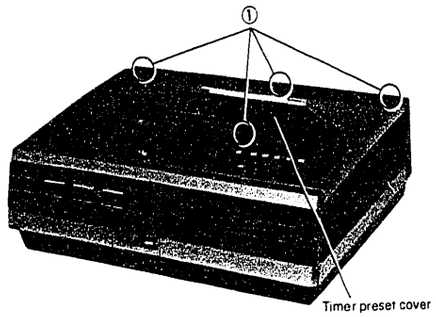


Fig. 1

2. Timer Pre-set Cover

② 2 hinge. (Fig. 2, 3)

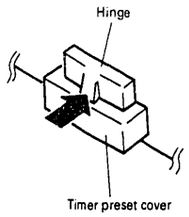


Fig. 2

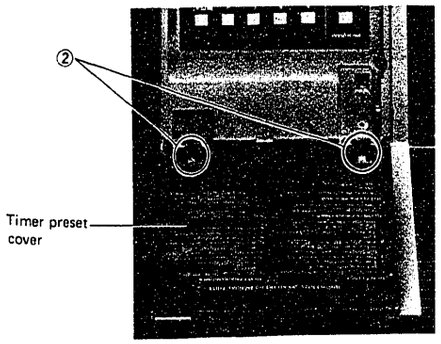


Fig. 3

3. Bottom Cover

③ 6 screws. (Fig. 4)

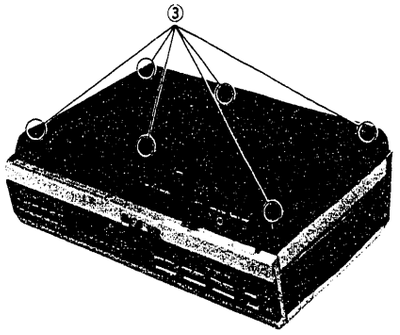


Fig. 4

4. Front Panel

1) Open the switch cover and pre-set cover.
2) ④ 6 screws. (Fig. 5, 6)

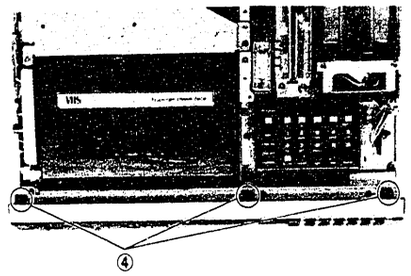


Fig. 5

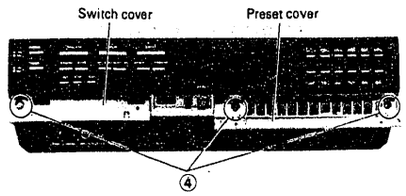


Fig. 6

5. Front Switch P.C.B.
⑤ 5 screws. (Fig. 7)

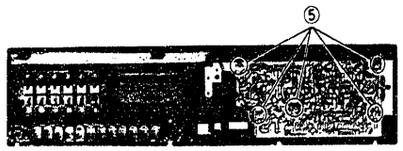


Fig. 7

6. Sub Chassis (with timer control block)
1) Remove the front bracket.
⑥ 3 screws. (Fig. 8)
2) ⑦ 4 screws. (Fig. 8)
3) Remove the sub chassis.
⑧ pull. (Fig. 9)

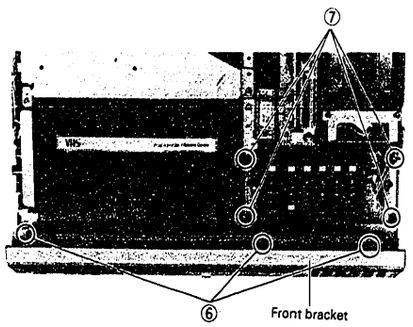


Fig. 8

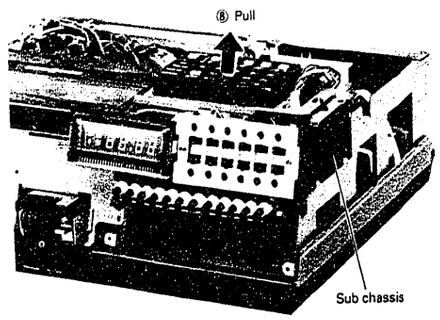


Fig. 9

7. Channel Pre-set P.C.B.
⑨ 2 screws. (Fig. 10)

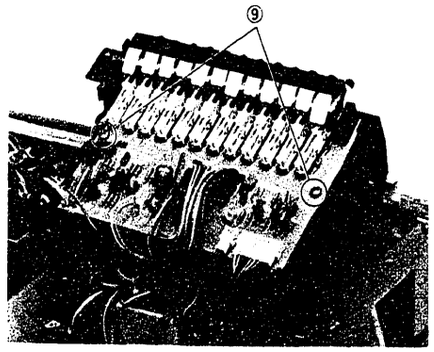


Fig. 10

8. Channel Pre-set Key P.C.B.
⑩ 2 screws. (Fig. 11)

9. Timer Control P.C.B.
⑪ 2 screws. (Fig. 11)

10. Display P.C.B.
⑫ 1 screws. (Fig. 11)

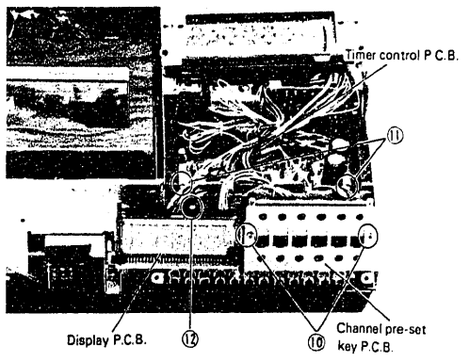


Fig. 11

11. Audio P.C.B.
⑬ 2 stoppers (Fig. 12, 13)

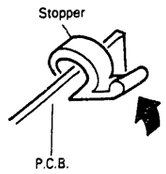


Fig. 12

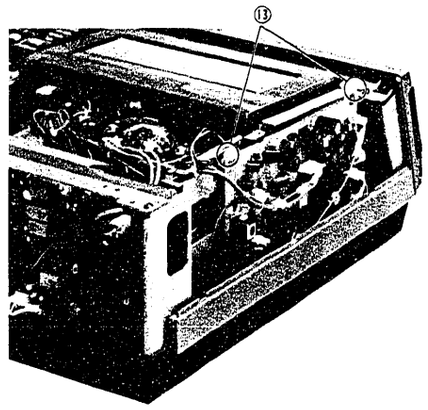


Fig. 13

12. WYC P.C.B.
1) Disconnect video head connector. (PG201)
2) ⑭ 2 stoppers. (Fig. 14)

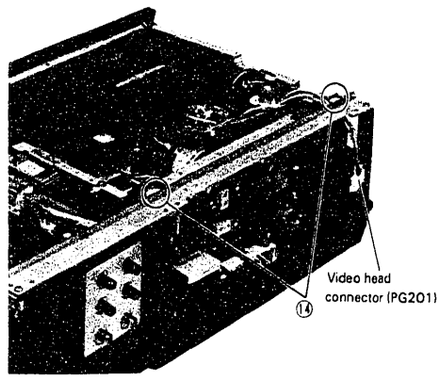


Fig. 14

13. Power Supply (Line Filter) P.C.B.
1) Remove the rear cover.
⑮ 4 screws. (Fig. 15)
2) Remove the RF converter unit.
㉕ 1 screw. (Fig. 15)
3) ⑯ 2 screws. (Fig. 16)

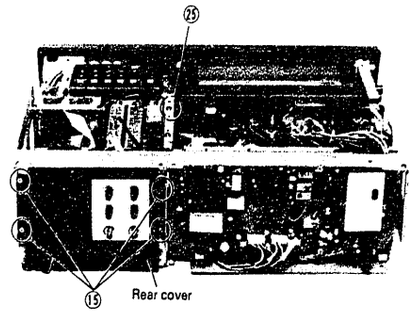


Fig. 15

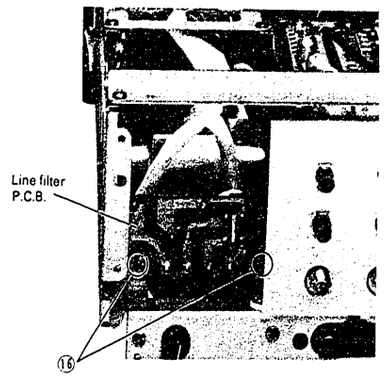


Fig. 16

14. Power Supply P.C.B.

1) Remove the powertransformer.
   ⑰ 2 screws. (Fig. 17)
2) ⑱ 2 screws. (Fig. 17)

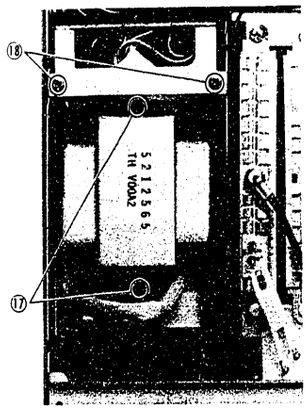


Fig. 17

15. PSS P.C.B. (Servo and system control block)

⑲ 4 screws. (Fig. 18)

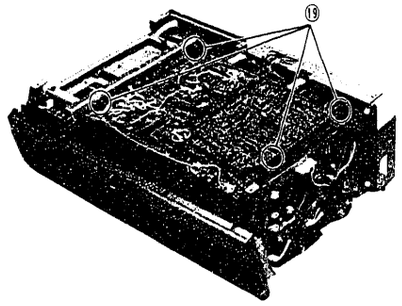


Fig. 18

16. RF-IF P.C.B. Block

1) Remove the rear cover.
   ⑳ 4 screws. (Fig. 19)
2) Remove the rear bracket.
   ㉑ 2 screws. (Fig. 19)
3) ㉒ 2 screws. (Fig. 20)

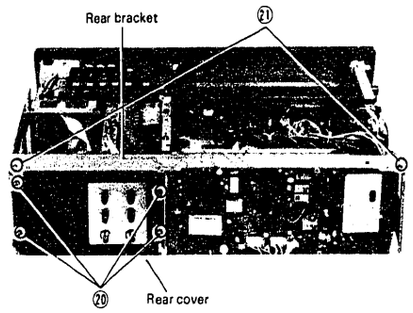


Fig. 19

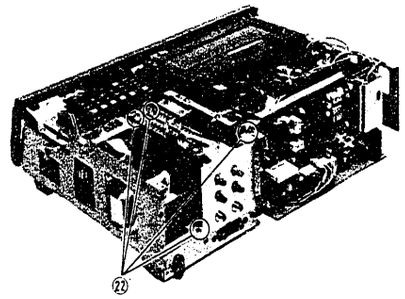


Fig. 20

17. Cassette Housing

㉓ 4 screws. (Fig. 21)

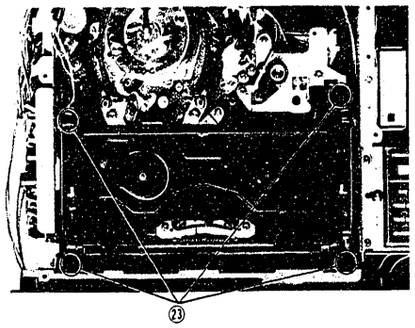


Fig. 21

18. Main Chassis

㉔ 4 screws. (Fig. 22)

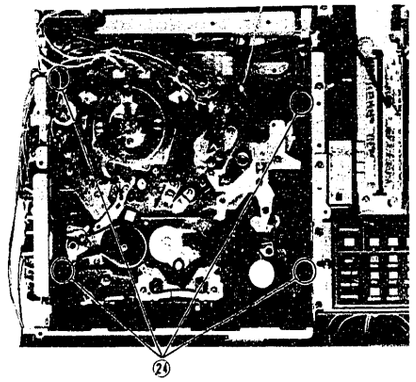


Fig. 22

19. Reel Motor

1) ㉕ 2 screws. (Fig. 23)

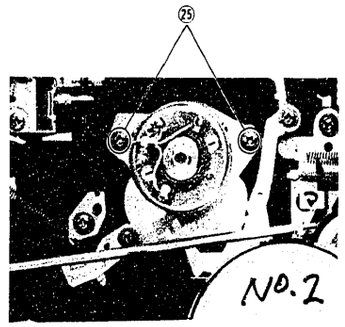


Fig. 23

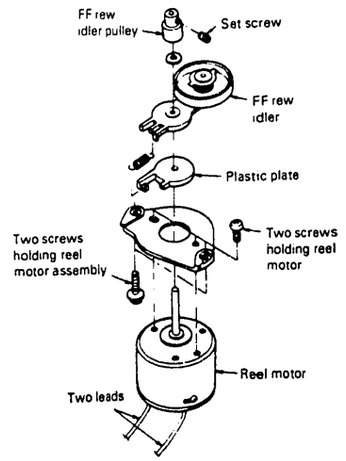


Fig. 24

20. Take-up, Supply Reel Disk

1) ㉖ stopper washer. (Fig. 27)

Note: 1. Pay particular attention to the washer and thrust bearing located under the reel disk as they determine the proper disk height.

2. Before removing the supply reel disk, it will be necessary to remove the tension band.

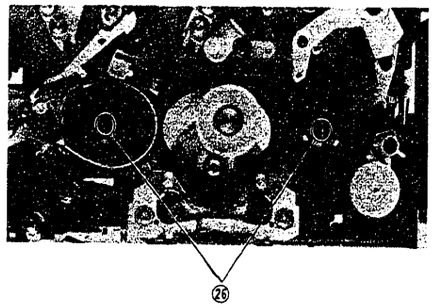


Fig. 27

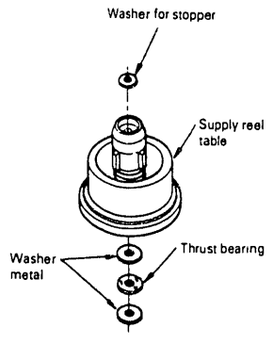


Fig. 25

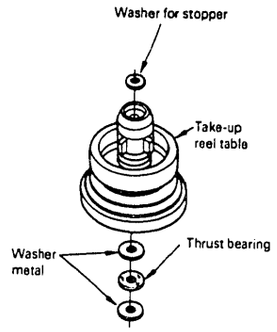


Fig. 28

21. Audio Control Head

1) ㉗ 1 nut (Fig. 26)

2) ㉘ 2 screws (Fig. 26)

Note: When replacing the A/C head, it is necessary to adjust head height, angle, X value, etc.

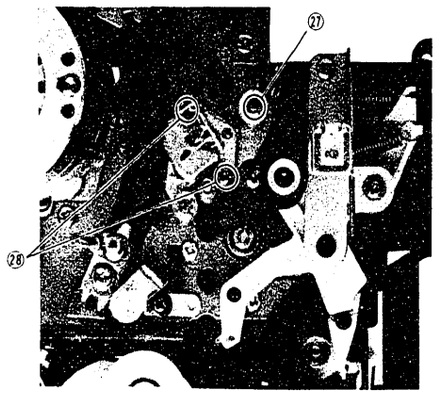


Fig. 26

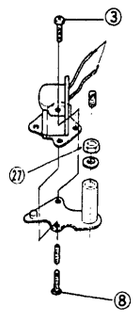


Fig. 29

22. Full Erase Head

1) Remove FE head arm.
㉙ 1 screw. (Fig. 30)

2) ㉛ 2 screws. (Fig. 30)

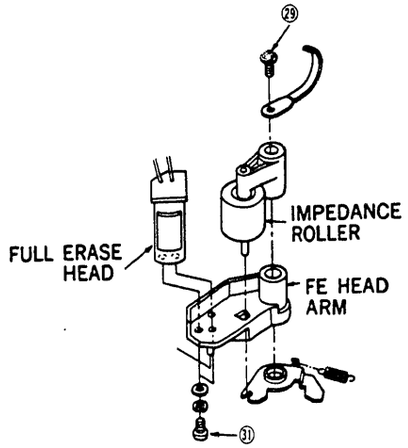


Fig. 30

23. D-D Capstan Motor

1) Remove 2 springs ㉜ (Fig. 31)

2) ㉝ screws.

3) ㉟ 4 screws. (Fig. 31, 32)

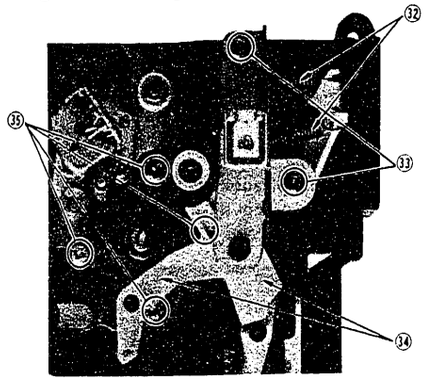


Fig. 31

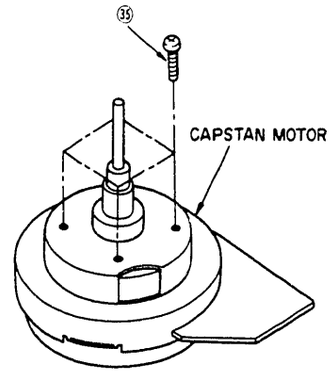


Fig. 32

24. Take-up Idler

1) Remove take-up idler twist spring. ㊱ (Fig. 33, 34)

2) Remove screw holding take-up assembly bracket. ㊲ (Fig. 33, 34)

3) Remove take-up assembly ㊳ and bracket simultaneously towards the bottom. (Fig. 33, 34)

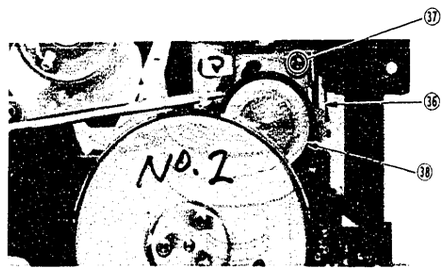


Fig. 33

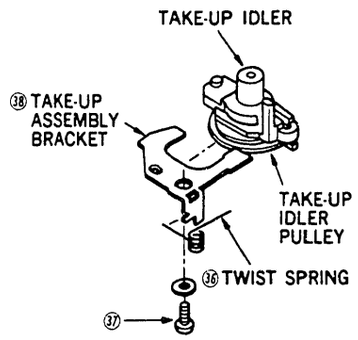


Fig. 34

25. D-D Cylinder Motor

1) Remove magnet plate
   ㊴ 2 screws. (Fig. 35, 36)
2) ㊵ 4 screws. (Fig. 35, 36)

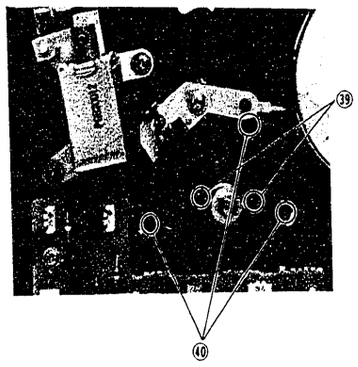


Fig. 35

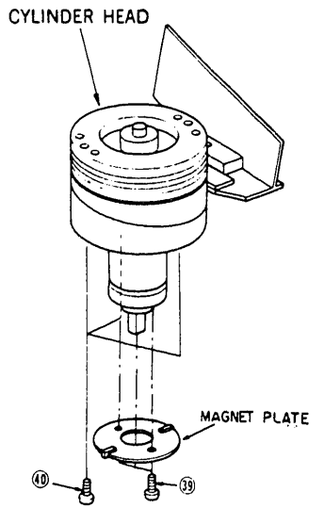


Fig. 36

26. Sub Chassis

1) Remove tension arm and supply reel sub brake.
   ㊶ Ering (Fig. 37)
2) ㊷ 6 screws. (Fig. 37)

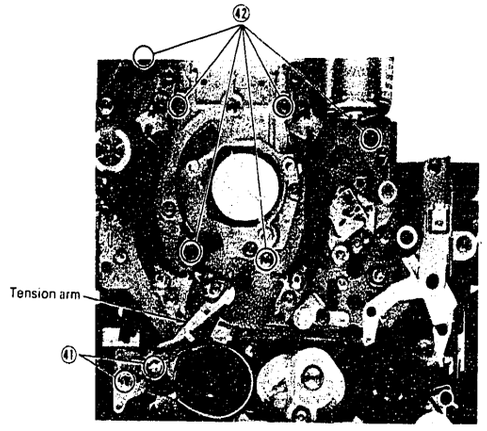


Fig. 37

27. Loading Gear

1) Remove sub chassis (Fig. 38)

Note: Be careful to ensure that the projections inside the gear wheels are in a straight line when replacing the loading gear.

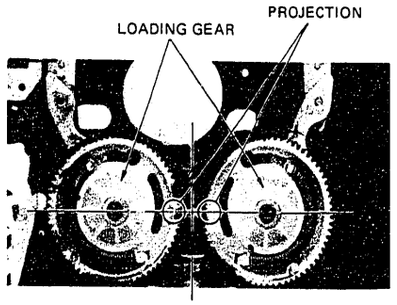


Fig. 38

28. Micro Switch (Pause switch)

1) Remove loading arm/slider.
2) ㊸, ㊹ 2 screws. (Fig. 39)

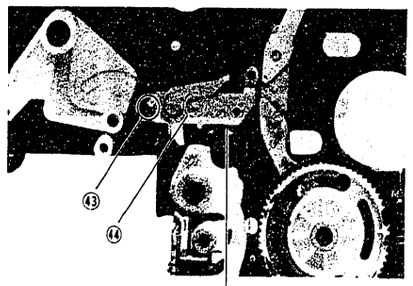


Fig. 39

ADJUSTMENT

SERVICING JIGS AND TOOLS

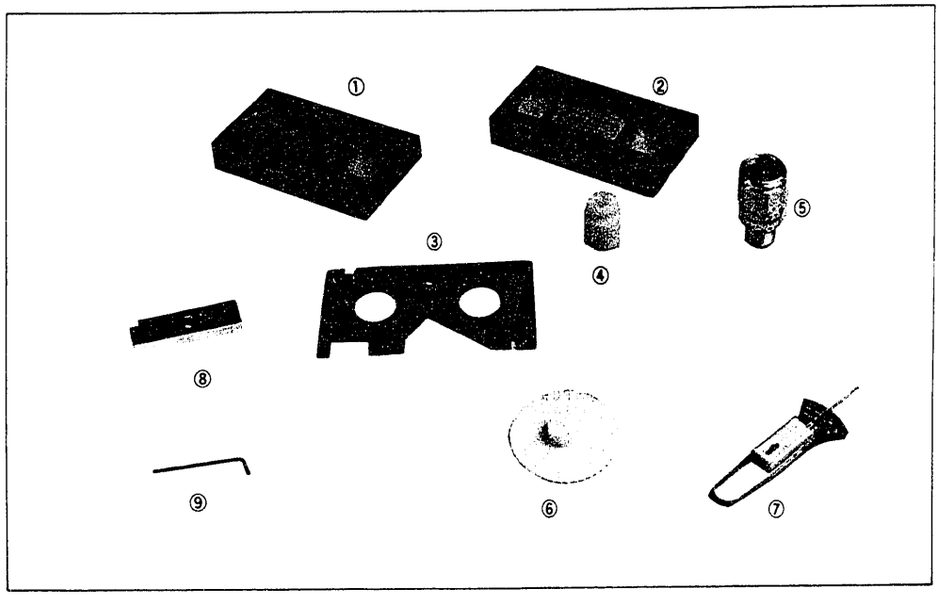


Fig. 40

1 Back tension meter
2 Alignment tape
3 Cassette housing positioning jig
4 Torque gauge adaptor
5 Torque gauge
6 Tension measurement reel
7 Fan type tension gauge
8 Reel disk height jig
9 Hexagonal wrench

ELECTRIC CIRCUIT ADJUSTMENT

SERVO BLOCK ADJUSTMENT

Before adjustment

To adjust the servo block, remove the upper and bottom covers and place the VTR with the audio PC Board being at the bottom as shown in Fig. 41, 42.

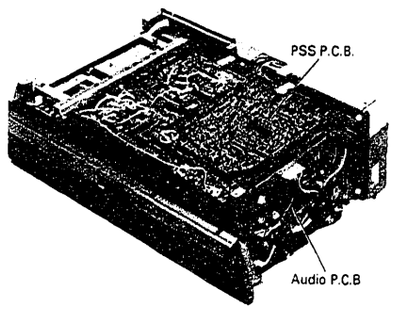


Fig. 41

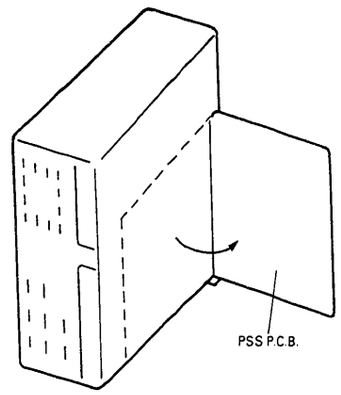


Fig. 42

PSS PC Board (Servo and system control block)

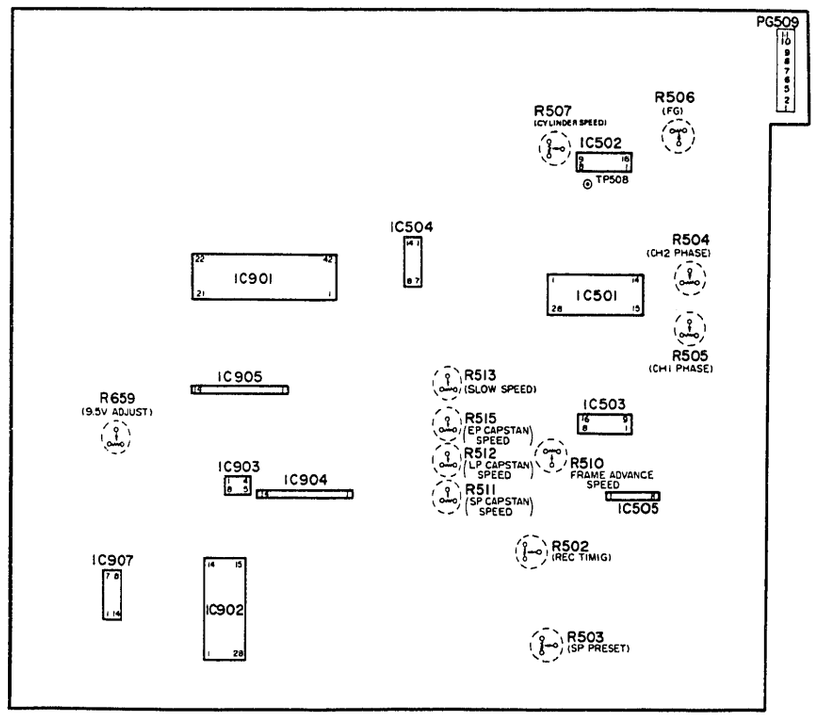


Fig. 43

1. 9.5Vreg. adjustment

Connection

Connect the DC voltmeter to PG509-②on the PSS pc board.

Mode

Turn power ON.

Adjustment Point

R659

Measurement Value

9.5V ±0.1V

2. Capstan speed adjustment

The purpose of this adjustment is to make the tape speed approx. 33.4 mm/sec in the SP mode, 16.7 mm/sec in the LP mode, 11.1 mm/sec in the EP Mode.

Tape Speed Adjustment	Tape Speed Selector	Connection	Adjustment
SP mode (33.4 mm/sec)	SP	Fig. 44	R511
LP mode (16.7 mm/sec)	LP		R512
EP mode (11.1 mm/sec)	EP		R515

Connection

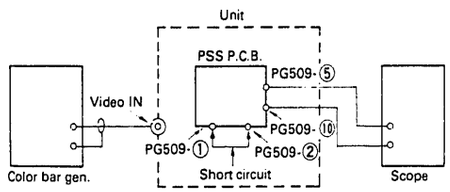


Fig. 44

Mode

Insert a blank tape and record a color bar signal or tune-in a local TV program at adjustment tape speed.

Adjustment

1) Short-circuit PG509-① and PG509-② and adjust the capstan speed controls (R511, R512, R515) so that the sample pulse is locked on the trapezoid waveform or the sample pulse flows as slowly as possible on the trapezoid waveform (Fig. 45).
2) Open-circuit PG509-① and PG509-② and confirm the sample pulse falls approximately on the center of the trapezoid's leading edge. (Fig. 46)

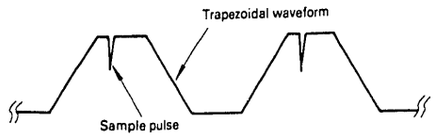


Fig. 45

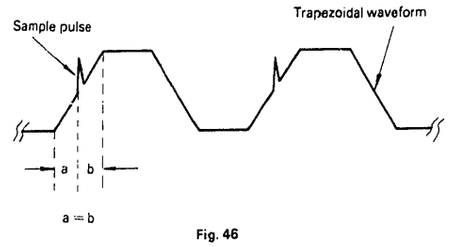


Fig. 46

3. Cylinder speed adjustment

The purpose of this adjustment is to make the cylinder speed 1800 rpm.

Connection

1) Connect the oscilloscope to PG509-⑦ on the PSS pc board.
2) Conect the color bar gen. to video input on the front panel or tune in a local on air TV program.

Mode

Insert a blank tape and record a color bar signal or tune-in a local TV program in the SP mode.

Adjustment point

R507

Adjustment

1) Short-circuit PG509-① and PG509② and adjust the cylinder speed control (R507), so that the sample pulse is locked on the trapezoid waveform or the sampling pulse flows as slowly as possible on the trapezoid waveform. (Fig. 45)
2) Open-circuit PG509-① and PG509-② and confirm that the sample pulse falls approximately on the center of the trapezoid's trailing edge. (Fig. 47)

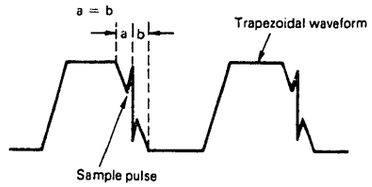


Fig. 47

4. Cylinder FG level adjustment

Connection

Connect the oscilloscope to PG509-⑥ on the PSS pc board.

Mode

Insert a blank tape and load.

Adjustment point

R506

Adjustment

Adjust the cylinder FG level control (R506) so that the ripple level is minimum. (Fig. 48)

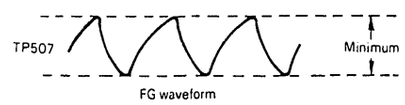


Fig. 48

5. Head switching point adjustment

This adjustment positions the video head switching point so that head switching occurs 6.5 horizontal lines before the start of the vertical sync pulse or 3 lines before the start of the equalizing pulse. (Figs. 49, 50)

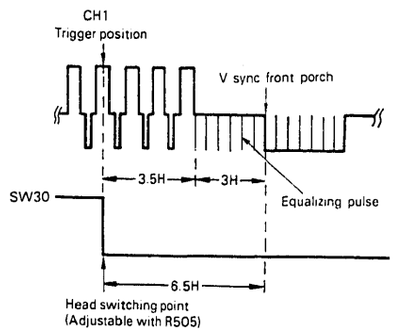


Fig. 49

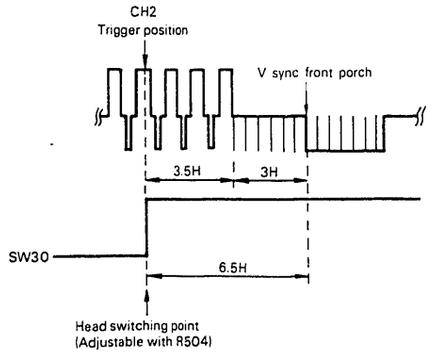


Fig. 50

Connection

Connect the oscilloscope to video output on the front panel, and apply synchronization with the signal from PG509-⑧ on the PSS pc board.

Mode

Insert an alignment tape and playback a color bar signal in the SP mode.

Adjustment Point

Adjustment channel	Oscilloscope sync slope	Adjustment
CH1	–	R505
CH2	+	R504

Adjustment

1) Set the synchronizing range of the oscilloscope to "EXT", and set the sync slope to "–" at channel 1 (CH1) adjustment, or "+" at channel 2 (CH2) adjustment.
2) Adjust the PG shifter controls (R505, R504) so that the start of the trigger position is 6.5H before the start of the vertical sync pulse. (Figs. 49, 50)

Note: It is difficult to count 6.5H, so adjust R505 and R504 so that the equivalent pulse is approx. 220 μsec (3.5H) after the trigger position.
If head switching occurs too soon, a narrow noise band may appear at the bottom of the picture.
If the head switching pulse is late, noise can be introduced during vertical sync, possibly resulting in vertical sync problems.

6. Record shifter adjustment

Connection

1) Connect the oscilloscope to video output on the front panel and apply synchronization with the signal from PG509-⑧ on the PSS pc board.
2) Connect the color bar gen. to video input on the front panel or tune in a local on air TV program.

Mode

Insert a blank tape and record a color bar signal or tune-in a local TV program in the SP mode.

Adjustment Point

R502

Adjustment

Same as head switching point adjustment.

7. Tracking preset adjustment (SP PRESET)

Connection

1) Connect the oscilloscope to TP202 on the WYC pc board.
2) Connect the color bar gen to video input on the front panel or tune in a local TV program.

Mode

1) Insert a blank tape and record a color bar signal or tune-in a local TV program for 1 – 2 minutes in the SP mode.
2) Playback the portion just recorded.

Adjustment Point

R503

Adjustment

Set the tracking control (RV502) to the click position, and adjust the tracking preset control (R503) so that the FM wave level at TP202 is maximum. (Fig. 51)

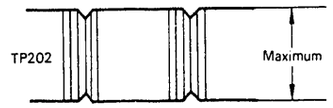


Fig. 51

8. SLOW speed adjustment

Connection

Same as capstan speed adjustment.

Mode

1) Insert a blank tape and record a color bar signal or tune-in a local TV program for 1 – 2 minutes in the EP mode.
2) Playback, in the SLOW mode, the portion just recorded.

- **Adjustment Point**
  R513
- **Adjustment**
  1) Short-circuit PG509-① and PG509-②, and adjust the slow speed control (R513) so that the pair of sampling pulses are locked on the two periodic trapezoid waveforms or the pair of sampling pulses flow as slowly as possible. (Fig. 52)
  2) After adjustment, open circuit PG509-① and PG509-②.

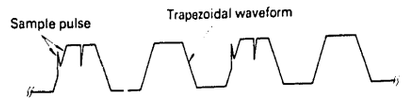


Fig. 52

9. CUE speed confirmation

Connection

1) Connect the frequency counter to IC503-Pin 8 on the PSS pc board.
2) Connect the color bar gen. to video input on the front panel or tune in a local TV program.

Mode

1) Insert a blank tape and record a color bar signal or tune in a local TV program for 1 – 2 minutes in the EP mode.
2) Playback, in the CUE mode, the portion just recorded.

Confirmation

2500 Hz ±150 Hz

10. QUE offset confirmation

Connection

1) Connect the frequency counter to IC502-⑧ on the PSS pc board.
2) Connect the color bar gen to video input on the front panel or tune in a local TV program.

Mode

1) Insert a blank tape and record a color bar signal or tune in a local TV program for 1 – 2 minutes in the EP mode.
2) Playback, in the QUE mode, the portion just recorded.

Confirmation

122 Hz ±1 Hz

11. REVIEW offset confirmation

Connection

Same as QUE offset confirmation

Mode

1) Insert a blank tape and record a color bar signal or tune in a local TV program for 1 – 2 minutes in the EP mode.
2) Playback, in the REVIEW mode, the portion just recorded.

Confirmation

118 Hz ±1 Hz

12. Frame advance speed adjustment

Connection

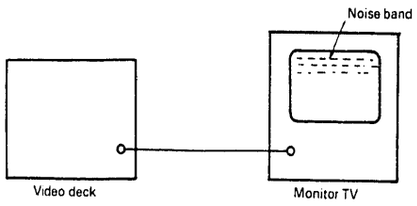


Fig. 53

Mode

1) Insert a blank tape and record a color bar signal or tune in a local TV program for 1 – 2 minutes in the EP mode.
2) Playback, in the PAUSE mode, the portion just recorded.

Adjustment Point

R510

Adjustment

Short-circuit PG509- ⑩ and PG509- ⑪, and adjust the frame advance speed control (R510) so that the noise band appearing on the monitor TV when the frame advance button is kept pressed in the pause mode flows 18 to 20 times in 10 seconds.

13. QUICK preset confirmation

Connection

1) Connect the monitor TV to RF converter output on the rear panel.
2) Connect the color bar gen to video input on the front panel or tune in a local TV program.

Mode

1) Insert a blank tape and record a color bar signal or tune-in a local TV program in the EP mode.
2) Playback, in the QUICK mode, the portion just recorded.

Confirmation

Confirm the quick preset control so that the noise band on the monitor TV becomes as shown in Fig. 54.

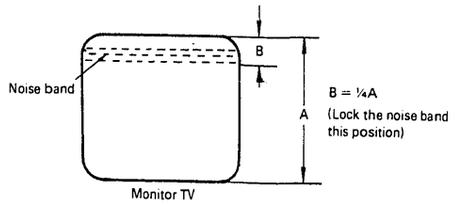
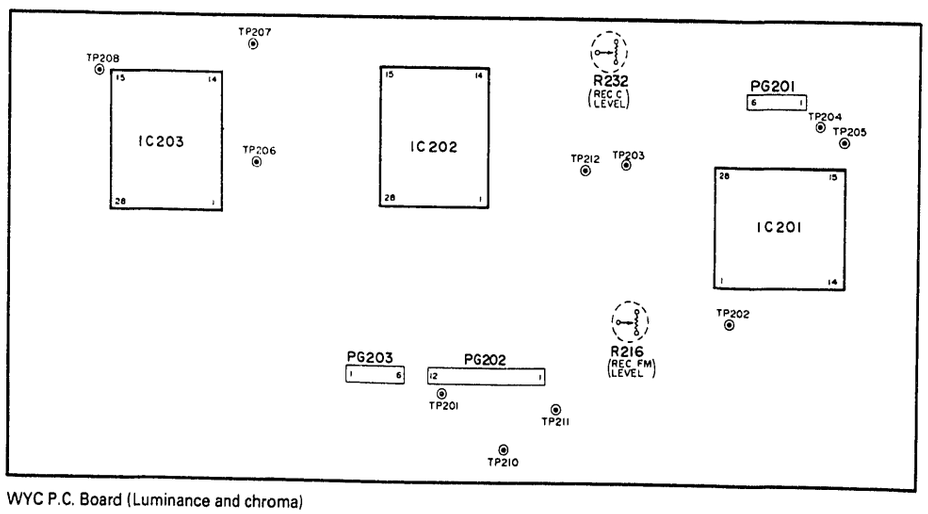


Fig. 54

WYC BLOCK ADJUSTMENT



WYC P.C. Board (Luminance and chroma)

Fig. 55

1. Video agc output level confirmation

Connection

1) Connect the oscilloscope to TP212 on the WYC pc board.
2) Connect the color bar gen to PG202-1 and PG202-2 on the WYC pc board.

Mode

Insert a blank tape and record a color bar signal in the SP mode.

Confirmation

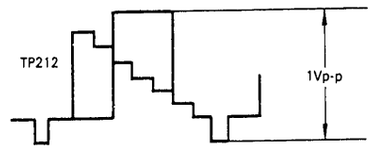


Fig. 56

2. EE level confirmation

Connection

1) Connect the oscilloscope to TP201 on the WYC pc board.
2) Connect the color bar gen to PG202-1 and PG202-2 on the WYC pc board.

Mode

Insert a blank tape and record a color bar signal in the SP mode.

Confirmation

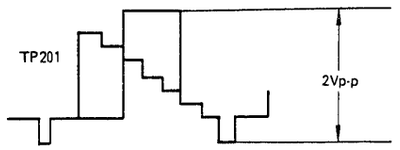


Fig. 58

3. White clip and dark clip confirmation

Connection

1) Connect the oscilloscope to TP205 on the WYC pc board.
2) Connect the color bar gen to PG202-1 and PG202-2 on the WYC pc board.

Mode

Insert a blank tape and record a color bar signal in the SP mode.

Confirmation

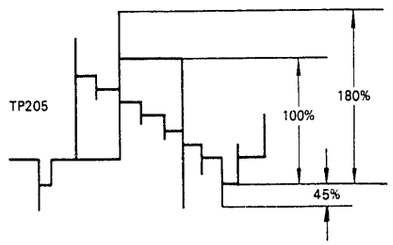


Fig. 57

4. Local Fo confirmation (3.58 MHz Xtal osc)

Connection

1) Connect the frequency counter to TP208 on the WYC pc board.
2) Connect the color bar gen to PG201-1 and PG201-2 on the WYC pc board.

Mode

Stop mode.

Confirmation

3.579545 MHz ±100 Hz

5. Record chroma level adjustment

Connection

1) Connect the oscilloscope to TP204 on the WYC pc board.
2) Connect the color bar gen to PG201-1 and PG201-2 on the WYC pc board.

Mode

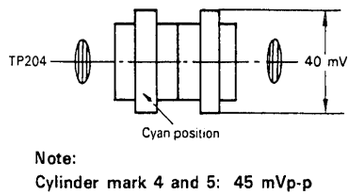
Insert a blank tape and record a color bar signal in the SP mode.

Adjustment Point

R216 (Record chroma level control)
R232 (Record luminance level control)

Adjustment

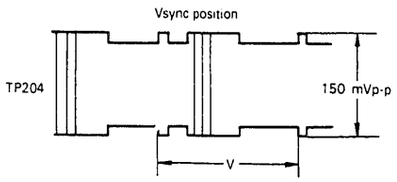
1) Turn the record luminance level control (R232) fully counterclockwise and adjust the record chroma level control (R216) so that the cyan portion becomes 40 mVp-p. (Fig. 59)



Note:
Cylinder mark 4 and 5: 45 mVp-p

Fig. 59

2) Adjust the record luminance level control (R232) so that the V sync portion on the envelope at TP204 becomes 140 mVp-p. (Fig. 60)



Note
Cylinder mark A: 140 mVp-p
B: 160 mVp-p

Fig. 60

6. Playback gain confirmation

Connection

Connect the oscilloscope to TP201 on the WYC pc board.

Mode

Insert an alignment tape and playback the color bar signal in the SP mode.

Confirmation

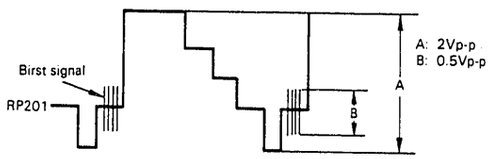
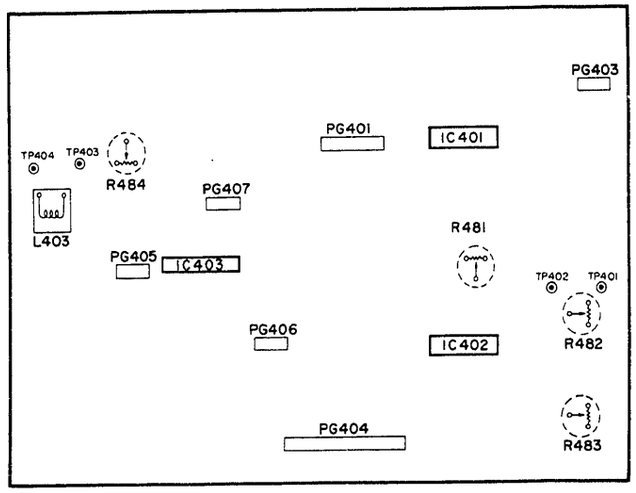


Fig. 61

AUDIO BLOCK ADJUSTMENT



Audio PC Board

Fig. 62

1. Audio/control head azimuth adjustment

Connection

Connect the VTVM to audio output on the rear panel.

Mode

Insert an alignment tape (Recorded a 7 kHz audio signal) and playback signal.

Adjustment Point

See Fig. 63.

Adjustment

Adjust the azimuth adjustment screw for maximum output.

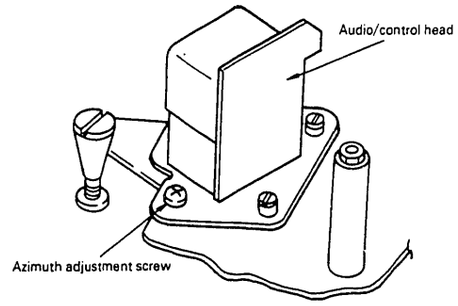


Fig. 63

2. Noise canceller adjustment

Connection

1) Connect the oscilloscope CH1 to TP411 and TP402 (GND) on the audio pc board.
2) Connect the oscilloscope CH2 to audio output on the rear panel.

Mode

Insert a blank tape and load.

Adjustment Point

R482, R483

Adjustment

1) Turn the FG level control (R482) fully clockwise and adjust the phase control (R483) so that the phase of the channel-1 signal is 180° out of phase with the channel-2 signal (Fig. 64).
2) Adjust the FG level control (R482) for minimum amplitude (Fig. 64).

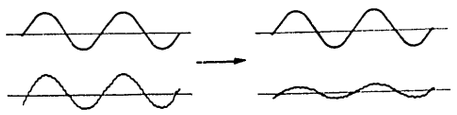


Fig. 64

3. Playback gain adjustment

Connection
Same as audio/control head azimuth adjustment.
Mode
Insert an alignment tape (Recorded a 1 kHz, 0 dB audio signal) and playback the signal.
Adjustment Point
R481
Adjustment
Adjust the playback gain control (R481) so that the audio output becomes −4 dBm.

4. Bias trap adjustment (Bias freq. 70 kHz ±8 kHz)

Connection
1) Connect the VTVM to TP403 and TP404 on the audio pc board.
2) Connect the color bar gen to video input on the front panel.
Mode
Insert a blank tape and record a color bar signal or tune-in a local TV program in the SP mode.
Adjustment Point
L403
Adjustment
Adjust the bias trap (L403) for minimum output.

5. Bias level adjustment

Connection
See Fig. 65.
Mode
Insert a blank tape and record a color bar signal or tune-in a local TV program in the SP mode.
Adjustment Point
R484
Adjustment
1) Adjust the bias level (R484 for 4 mV in the SP mode.
2) Confirm the bias level for 3 mV ±0.2 mV in the LP or EP mode.

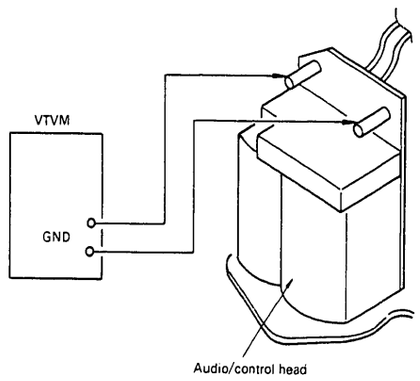


Fig. 65

Recording tape speed	Bias level	Remark
SP mode	4 mV	Adjustable (R484)
LP mode	3 mV ±0.2 mV	
EP mode	3 mV ±0.2 mV	

TUNER AND IF BLOCK ADJUSTMENT

Note: In this unit, the tuner and IF pack is a single unit as a replacement part.
It has been adjusted carefully, but if it gets out of adjustment, adjust it by the following procuedre. When it is desired to adjust the tuner and IF pack, remove this block from the unit.

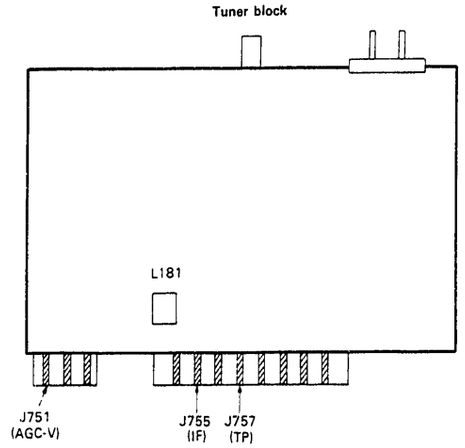


Fig. 66

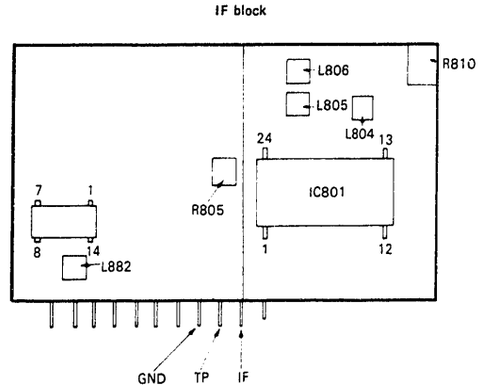


Fig. 67

1. Carrier filter adjustment

Connection
(1) Connect the pattern generator to the antenna terminal at the back of the main body.
(2) Connect the oscilloscope to the TP terminal of the IF pack.
Mode
Turn power ON.
Adjustment Point
L805
Adjustment
Receive the white pattern, then turn the core of L805 gradually counterclockwise from the full clockwise position to adjust so that the spacing between the sync tip and white peak is a minimum as shown in the diagram above.
Set the input level to −41 dBm ±10 dBm at the IF terminal of the IF pack at that time.

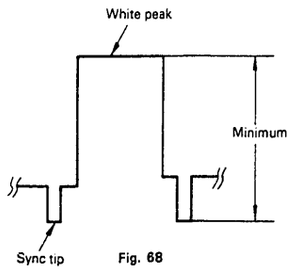


Fig. 68

2. Video output adjustment

Connection
(1) Connect the pattern generator to the VHF antenna terminal at the back of the main body.
(2) Connect the oscilloscope to the VIDEO OUT terminal at the IF pack.
Mode
Turn power ON.
Adjustment Point
R805
Adjustment
Receive the white pattern and adjust so that spacing between the white peak and the sync tip is 1 Vp-p as shown in the diagram above.
Set the input level to −41 dBm ±10 dBm at the IF terminal of the IF pack.

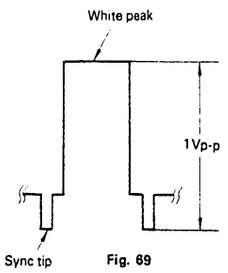


Fig. 69

3. 4.5 MHz Trap adjustment

Connection

Connect the sweep generator (40 to 50 MHz) to the IF terminal of the IF pack via the coupling circuit shown in Fig. 70.)

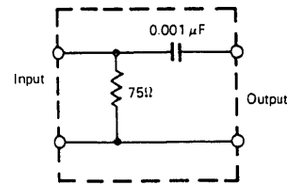


Fig. 70

(1) Loose-couple the marker generator (41.25 MHz) with the sweep generator.
(2) Connect the oscilloscope to the TP pin of the IF pack.
(3) Insert the 50Ω resistor between pins 19 and 18 of IC801.
(4) Connect the IC801 pin 22 to the GND terminal.
(5) Connect the +8.4V stabilized voltage power supply to IC801 pin 12.

Mode

Turn power ON.

Adjustment Point

L804

Adjustment

After obtaining the PIF waveform shown in the diagram, adjust so that the 41.25 MHz section is minimum. (Fig. 71)

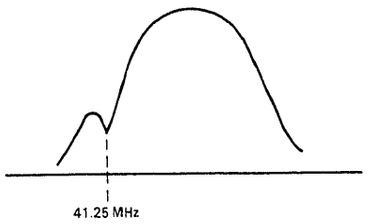


Fig. 71

4. AFC adjustment

Connection

(1) Connect the sweep generator (40 to 50 MHz) to the IF terminal of the IF pack via the coupling circuit shown in Fig. 70.
(2) Loose-couple the marker generator (45.75 MHz) with the sweep generator.
(3) Connect the oscilloscope to the IF terminal of the IF pack during adjustment procedure 1, and to IC801 pin 16 inside the IF pack during adjustment procedure 3.
(4) Connect the +8.3V stabilized voltage power supply to IC801 pin 12 of the IF pack.
(5) Connect IC801 pin 22 of the IF pack and the GND terminal.

Mode

Turn power ON.

Adjustment Point

L806

Adjustment

(1) Connect the oscilloscope to the IF terminal of the IF pack and adjust the output of the sweep generator so that the waveform of this terminal is 1 Vp-p.
(2) Connect the oscilloscope to IC801 pin 16 inside the IF pack, set to DC range and adjust so that the output voltage at 45.75 MHz is 6.5V. (Fig. 72)

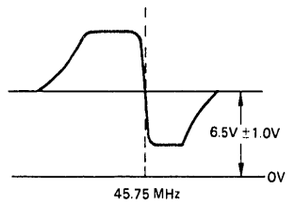


Fig. 72

5. SIF adjustment

Connection

(1) Connect the AM signal generator to the contact point of R881 and L881 of the IF pack via the coupling circuit shown in Fig. 73.

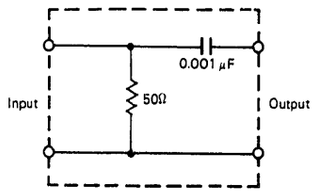


Fig. 73

(2) Connect the IC881 pin 6 of the IF pack and the GND terminal.
(3) Connect the oscilloscope to the AUDIO OUT terminal.

Mode

Turn power ON.

Adjustment Point

L882

Adjustment

Assuming the output of the AM signal generator to be −75 to −55 dBm (4.5 MHz ±5 kHz, 400 Hz, 30% AM modulation), adjust so that the signal amplitude of the AUDIO OUT terminal is a minimum at that time.

6. PIF adjustment

Connection

(1) Connect the sweep generator (40 to 50 MHz) tothe TP terminal of the tuner pack via the coupl'ng circuit shown in Fig. 75.
(2) Loose-couple the marker generator (41.25 MHz, 42.17 MHz, 45.75 MHz) with the sweep generator.
(3) Connect the oscilloscope to the TP terminal of the IF pack.
(4) Connect the +5.6V stabilized voltage power supply to J751 (AGC-V) of the tuner pack.
(5) Connect IC801 pin 22 of the IF pack and the GND terminal.
(6) Connect a 50Ω resistor between IC801 pins 18 and 19 of the IF pack.

Mode

Turn power ON.

Adjustment Point

L181

Adjustment

Adjust so that the PIF waveform level at each marker position shown in the diagram is within the specification shown on the diagram. (Fig. 74)

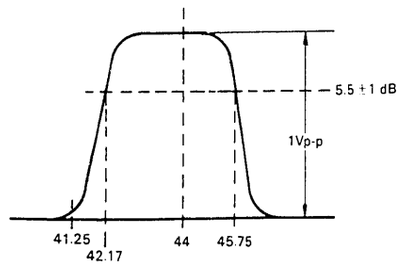


Fig. 74

7. AGC adjustment

Connection

(1) Connect the pattern generator to the VHF antenna terminal.
(2) Connect the VTVM to J751 (AGC-V) of the tuner pack.

Mode

Turn power ON.

Adjustment Point

R810

Adjustment

Adjust so that the voltage at J751 (AGC-V) is 9.2V ±0.1V when a non-modulated signal with an input level of −49 dBm is applied.

MECHANISM ADJUSTMENT

1. Reel table height

The height of the supply and take up reel tables should be thw same. (With ±0.2 mm tolerance). The height of the reel tables is adjusted by changing the number of washers under each table — See "Disassembly".
Check the height of the reel tables by installing the Height Reference Plate and the Reel Table Height Gauge as shown in Figure 45, and adjust so that the reel tables come between A and B.
Two sizes of washers are available; 0.25 mm and 0.5 mm. These should be used in combination to achieve the same reference height for both reel tables. (Fig. 75)

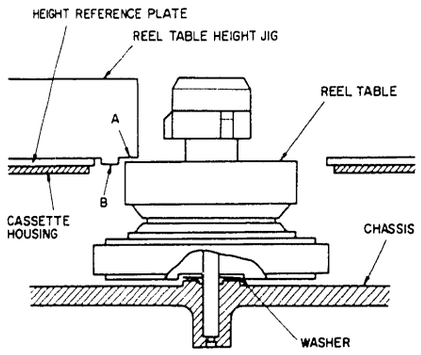


Fig. 75

2. Main brake mounting position

1) Adjust the two (2) screws holding the solenoid so that the chassis guide is 0.1 to 0.4 mm when the solenoid is ON (the plunger moves in the direction of the arrow). Check that the clearance between the brake conversion arm and the main bracke arm is 1.5 ±0.3 mm when the main brake is compressed against the supply and take-up reel tables. (Fig. 76)

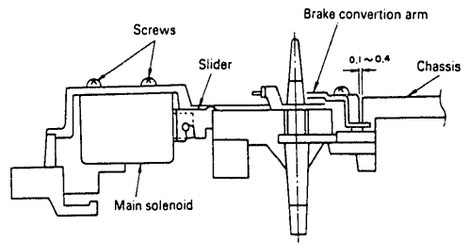


Fig. 76

2) Check that the clearance between the main brake and the supply and take-up reel tables is more than 0.3 mm when the latch solenoid is OFF (when the plunger moves in the opposite direction to the arrow).

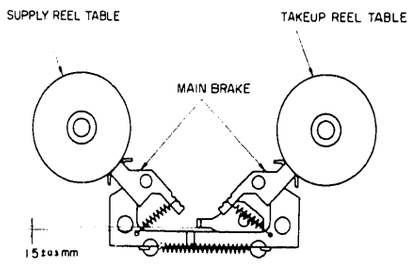


Fig. 77

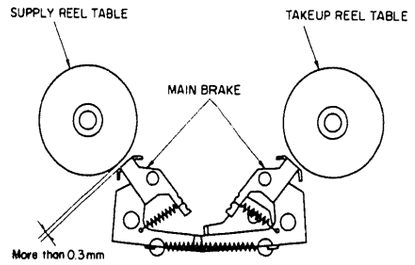


Fig. 78

3. Tension arm position

Optimum backtension is 35 — 45 g/cm. If it is not in this range, check the pole position of the tension arm.
If it is normal, adjust the backtension.

1) Tension arm pole position
Remove the top case and cassette housing, apply a blind to the end sensor, and then press the PLAY key to enter the loading mode. After loading is complete, check the pole of the tension arm, viewing from above, loosen screw (A), and adjust plate (A) so that the distance between the tension arm and the groove of the chassis just beneath the pole is within 0.2 — 0.8 mm. Adjustment procedure: Loosen screw (A) so that plate (A) does not slide smoothly, and adjust plate (A) using a screwdriver, so that chassis groove (B) as the fulcurum. Tighten screw (A) after adjustment is complete.

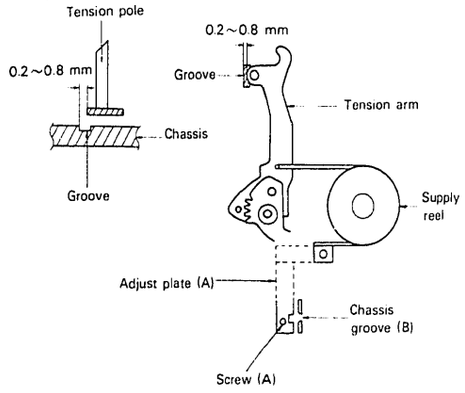


Fig. 79

2) Backtension
Mount the backtension meter, loosen screw (C) and adjust plate (B) so that the backtension is 35 — 45 gr/cm.
Adjustment procedure: Loosen screw (C) so that plate (B) does not slide smoothly and adjust plate (B) using a screwdriver to set the convex part (D) of the tension arm as the fulcurum. Tighten screw (C) after adjustment is complete.

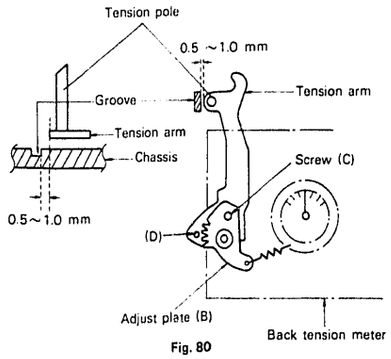


Fig. 80

4. Supply sub brake position

Check that the clearance between the supply reel table and the supply sub. brake is more than 0.3 mm in PLAY, REC, FF and REW modes. (Fig. 81)

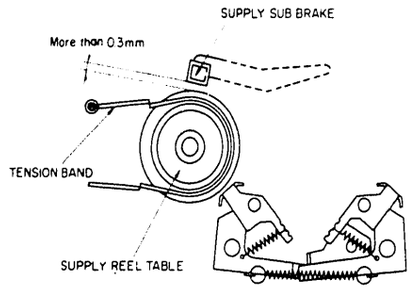


Fig. 81

5. Reel torque and back-tension

		Mode	Measurement reel	Measure-ment value	Remark
1	Main brake torque	STOP	Supply and Take-up reel	More than 200 gr.cm	Note 1
2	Slack removal torque	UNLOADING	Supply reel	100 to 200 gr.cm	Note 1
3	Rewind torque	REWIND	Supply reel	More than 200 gr.cm	Note 1
4	Take up torque	PLAY	Take-up reel	100 to 200 gr.cm	Note 1
5	F.F torque	FF	Take-up reel	More than 200 gr.cm	Note 1
6	Supply back-tension	FF	Supply reel	4 to 15 gr.cm	Note 2
7	Take-up back-tension	REW.	Take-up reel	4 to 15 gr.cm	Note 2
8	Take-up back-tension 1 Rev. search 2 Loading 3 Unloading 4 Rec. pause	1 Rev. 2 Loading 3 Unloading 4 Rec. phause	Take-up reel	50 to 120 gr.cm	Note 2

Note 1: Using the tension measurement reel, and pull the tension gauge gradually while the reel stops, and check the value immediately before the reel starts rotation.

Note 2: Wind the cord several turns on the tension measurement reel, pull the tension gauge gradually and check the value while the reel is rotating.

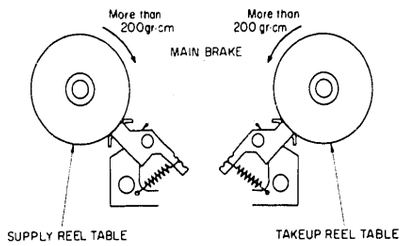


Fig. 81

6. Take-up reel rotation sensor position

Loosen the mounting screw to adjust in the direction of the arrow so that the clearance between the Hall IC and magnetic pulley is 0.5 ±0.2 mm. (Fig. 82)

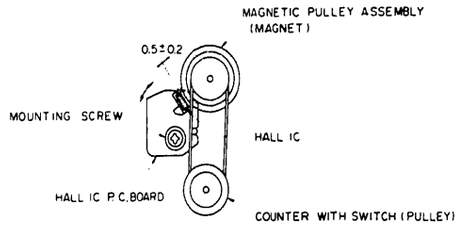


Fig. 82

7. Cylinder tach head position

Loosen the screw to adjust in the direction of the arrow so that the clearance between the Tach head and the magnet plate is 0.6 ±0.2 mm (Fig. 83).

Fig. 83

8. Micro switch mounting position

Turn the worm gear in the loading direction and adjust the installation of the micro-switch so that the switch lever (1) is stopped by the click of the plate spring and then is pushed in by a further 0.5 mm from the position where the micro-switch comes ON. (Fig. 84)

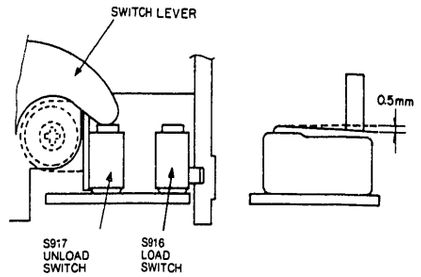


Fig. 84

9. Guide roller height

Install the height reference plate and place the reel table height jig onto it. Adjust the nut so that the clearance is 0 ±0.1. (Fig. 85)

Note: Electrical adjustment is required after mechanical adjustment is complete.

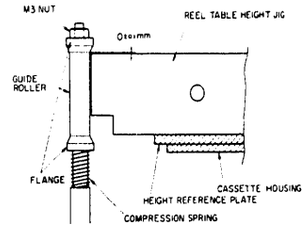


Fig. 85

10. Audio/Control head mounting position

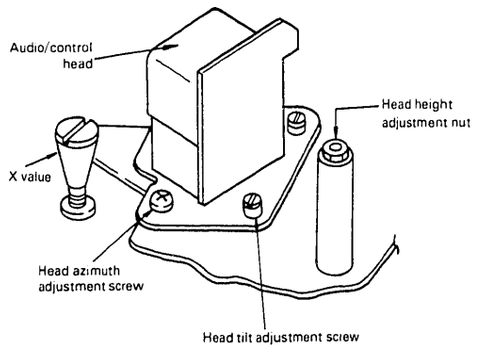


Fig. 86

1) Head height

Adjust the head height adjustment nut so that the Audio/control head height becomes as shown in Fig. 87.

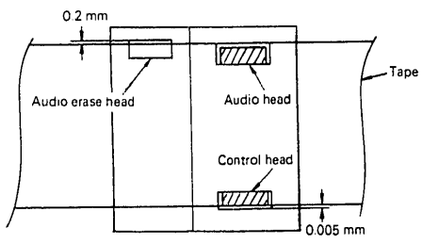


Fig. 87

2) Head azimuth

See audio block adjustment item 1.

3) X value

Connection:

Connect the oscilloscope to TP202 on the WYC board.

Mode:

Play the color bar signal from the alignment tape (MH-3)

Adjustment point:

X value adjustment screw

Adjustment:

The figure below shos the variation in the output of TP202 with respect to the positions of the tracking control knob when the X value is correctly adjusted.

The aim of adjustment is that the output curve matches point b' when the tracking control knob is positioned at the central click.

The adjustment procedure is as follows.

Adjust the X value adjustment screw so that the output reaches a peak with the tracking control knob positioned at the central click. Then, turn the tracking control knob 5 —10° clockwise and anti-clockwise and check the positions of the output peaks on the curve. Continue to adjust the knob so that point b' coincides with the output peak when the tracking control knob is positioned at the central click point.

a: 5 to 10° anti-clockwise from the central click b
b: Central click
c: 5 to 10° clockwise from the central click b

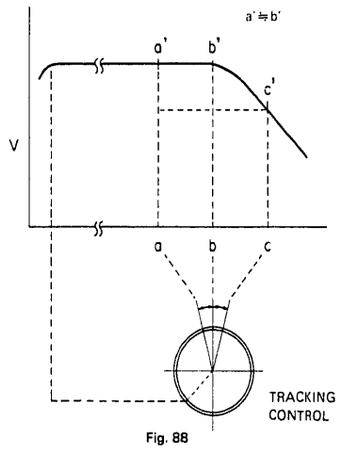


Fig. 88

4) Tilt

Adjust the tilt adjustment screw using the parallel check jig. (reel table height gauge) so that the head is parallel to the capstan.

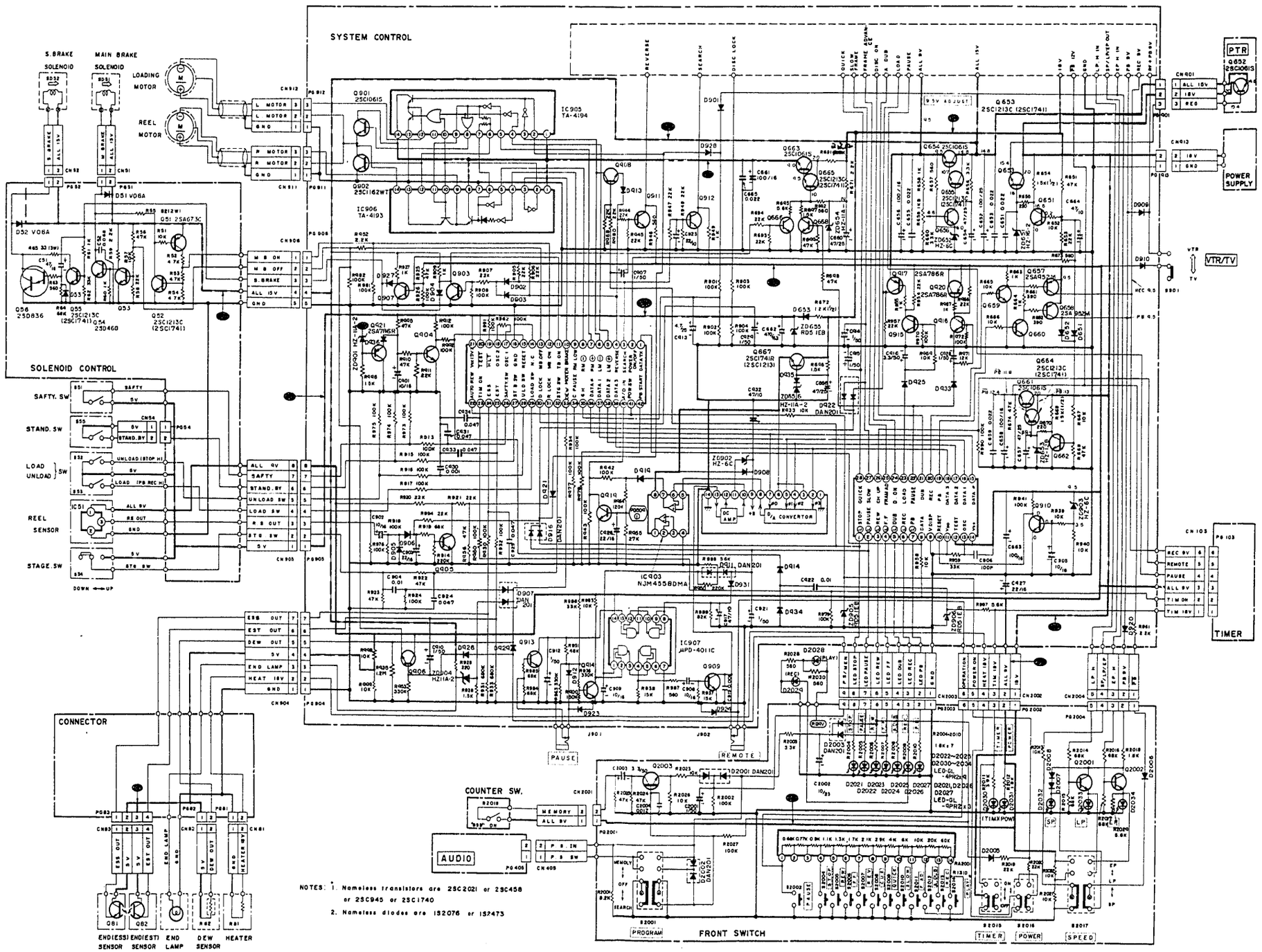
DIAGRAM

Abbreviation

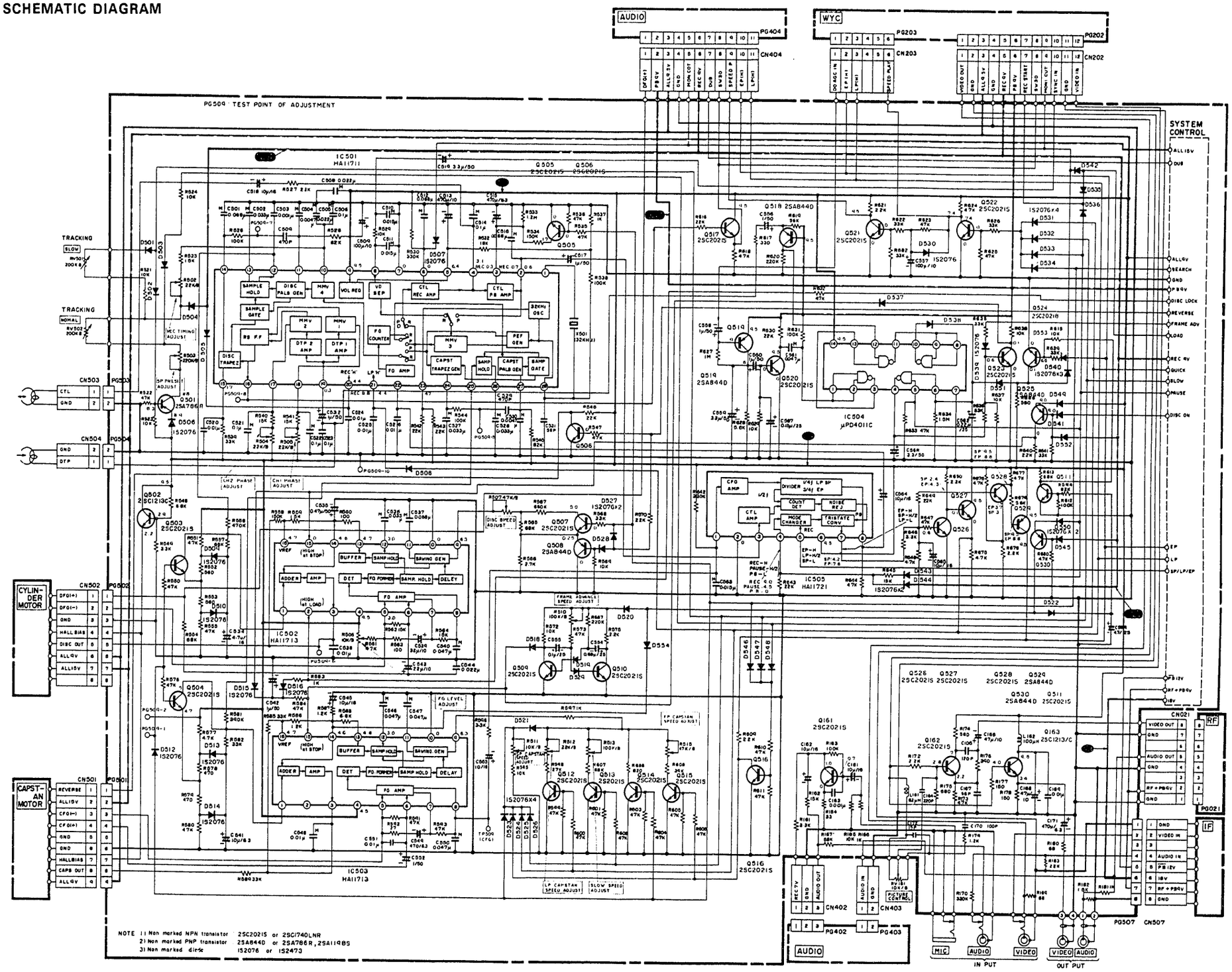
	Abbreviation	Name
A	AMP	Amplifier
	A/D IN	Analog/Digital converter input
	A. REC	Dubbing control
	ADD	Adding
	AE	Audio erase
	A	Audio
B	CTL	Control pulse
	CFG	Capstan frequency generator
	CONV.	Converter
	CAPS OUT	Capstan servo control
	CH1 ~ CH2	Video head channel
	CH-UP	Pre-set channel-up
	CH-SW	Pre-set channel switch
	CUE	Cueing
D	DTP	Cylinder tack pulse
	DO	Drop out
	DFG	Cylinder frequency generator
	DISC	Cylinder
	DUB	Dubbing
	DEW	Dew sensor
	DATA1 ~ 3	System control matrix pulse
	DISC LOCK	Cylinder rotation stop sensor
	DISC ON	Cylinder rotation control
	DE EMPH	De-emphasis
	D.W.	Dark and white
E	ESS	End stop sensor (Supply)
	EST	End stop sensor (Take-up)
	EP	Extra playback (6 Hours)
	EP 9V	Extra playback control
	EMPH	Emphasis
	EQ	Equalizer
F	FG	Frequency generator
	FRAM ADV.	Frame advance
	FE	Full erase
G	GEN.	Generator
H	HALL BIAS	Hall bias
	H1 ~ H3	Hall head
	HEAT	Cylinder heat
L	LP	Long play (4 Hours)
	LP 9V	Long play 9V
	LOAD	Loading
	LM⊕	Loading motor (Loading control)
	LM⊖	Loading motor (Unloading control)
M	MM	Mono-multivibrator
	MIC	Microphone
	MONI CUT	Monitor cut control
	MB ON	Main brake ON
	MB OFF	Main brake OFF
	MEMO	Memory

	Abbreviation	Name
P	PB	Playback
	PB 9V	Playback mode control
	PB PAUSE	Pause in the playback mode
	PS. STOP	Cueing stop
	PS. SW	Cueing switch
	PS/MEM	Cueing/Memory
	PB-Y	Luminance signal in the playback mode
	PB-C	Color signal in the playback mode
R	RS. FF.	Flip flop
	REF	Reference
	REC	Recording
	REC 9V	Recording mode control
	RM +	Reel motor take-up mode
	RM —	Reel motor supply mode
	R SENS.	Reel rotation sensor
	RM LOW	Reel motor supply slow speed mode
	REC-Y	Luminance signal in the recording mode
	REC-C	Color signal in the recording mode
	RECT	Rectifier
S	SW30	Head switching pulse 30 Hz
	SP	Standard play (2 Hours)
	SP 9V	Standard play mode control
	SPEED PLAY	Slow, Quick, and Video scan mode
	STG	Cassette housing position sensor
	SW	Switch
T	TRAPEZ	Trapezoid
	TB ON	Take-up reel brake ON
V	V SYNC	Vertical synchronize signal
	V SEP	V sync separator
Y	Y/C	Luminance/Color

SYSTEM CONTROL SCHEMATIC DIAGRAM

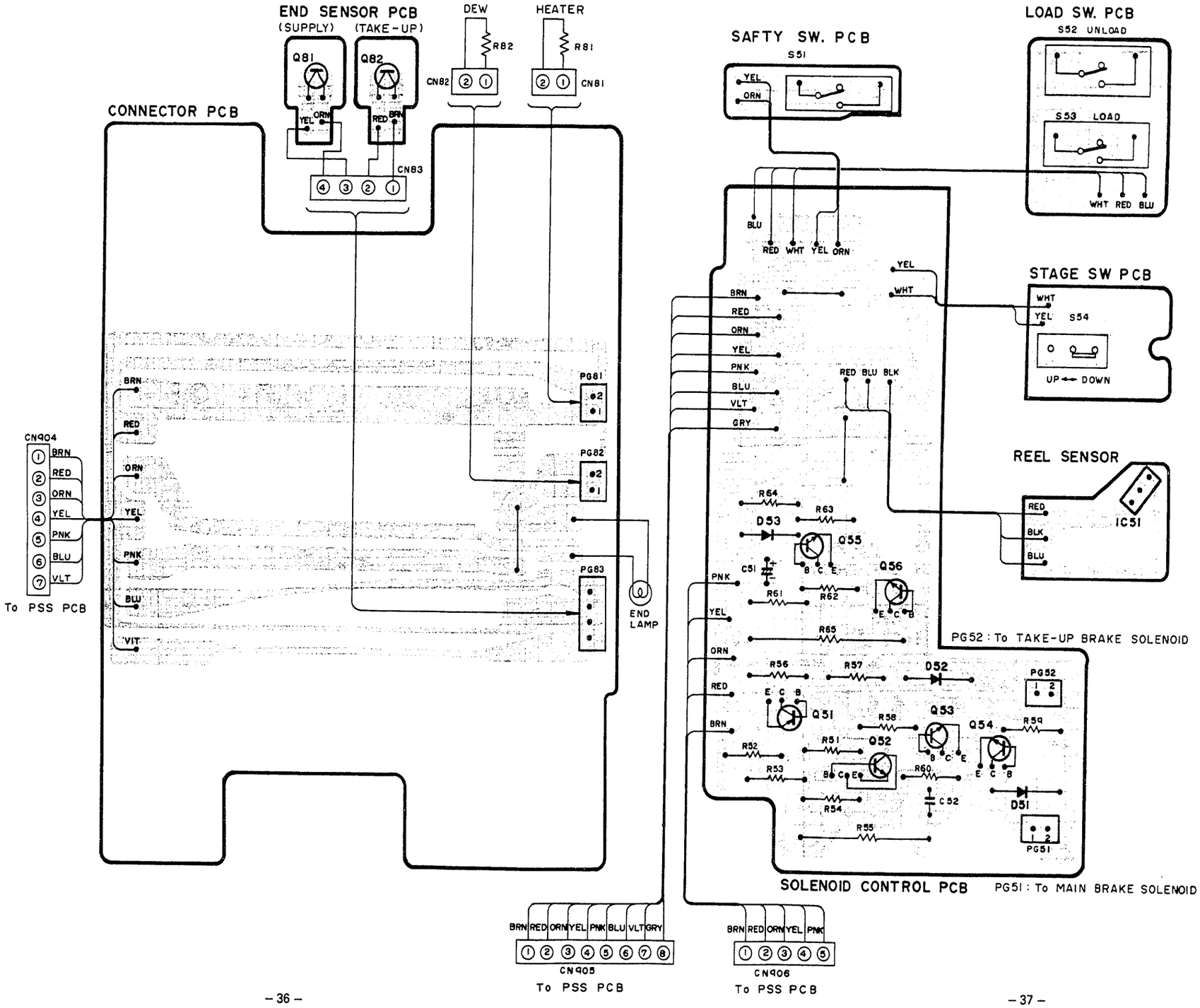


SERVO SCHEMATIC DIAGRAM



SOLENOID CONTROL AND CONNECTOR CIRCUIT BOARD DIAGRAM

(See system control schematic diagram)



CN904

1	GND
2	HEATER 18V
3	END LAMP
4	5V
5	DEW
6	EST OUT
7	ESS OUT

CN905

1	5V
2	STAGE SW
3	RS OUT
4	LOAD SW
5	UNLOAD SW
6	SAFTY SW
7	ALL 9V
8	

CN906

1	MAIN B. ON
2	MAIN B. OFF
3	SUB B. ON
4	ALL 15V
5	GND

PG51

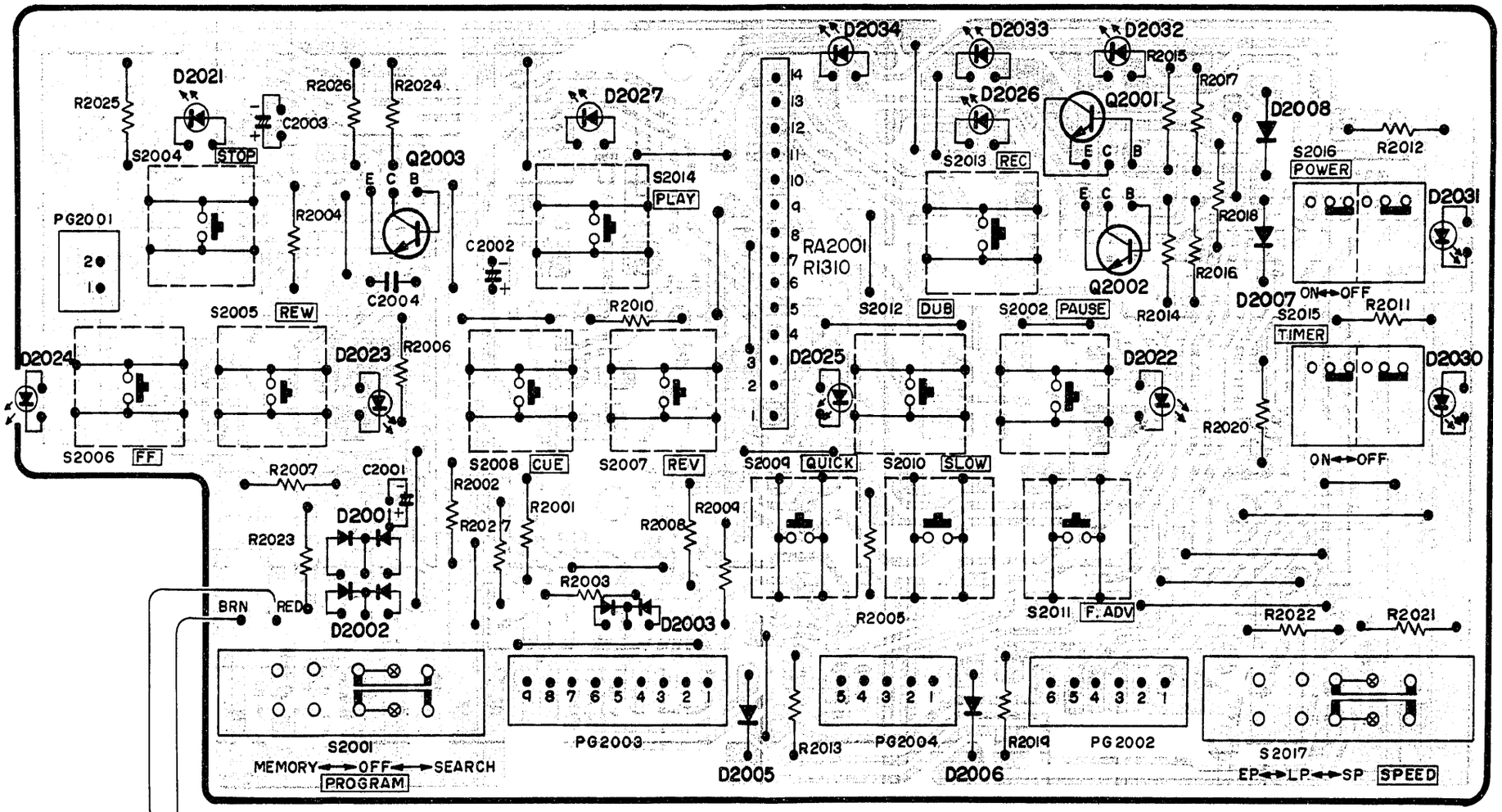
1	MAIN B.
2	ALL 15V

PG52

1	SUB B.
2	ALL 15V

FRONT SWITCH CIRCUIT BOARD DIAGRAM

(See system control schematic diagram)



PG2002 – 2004 : To SYSTEM CONTROL

FRONT SW

BRN RED

TO AUD PWB ① ② CN405

PG2001

1	ALL 9V
2	MEMORY

PG2002

1	OPERATION
2	POWER ON
3	HEATER 18V
4	TIMER 18V
5	ALL 9V
6	18V

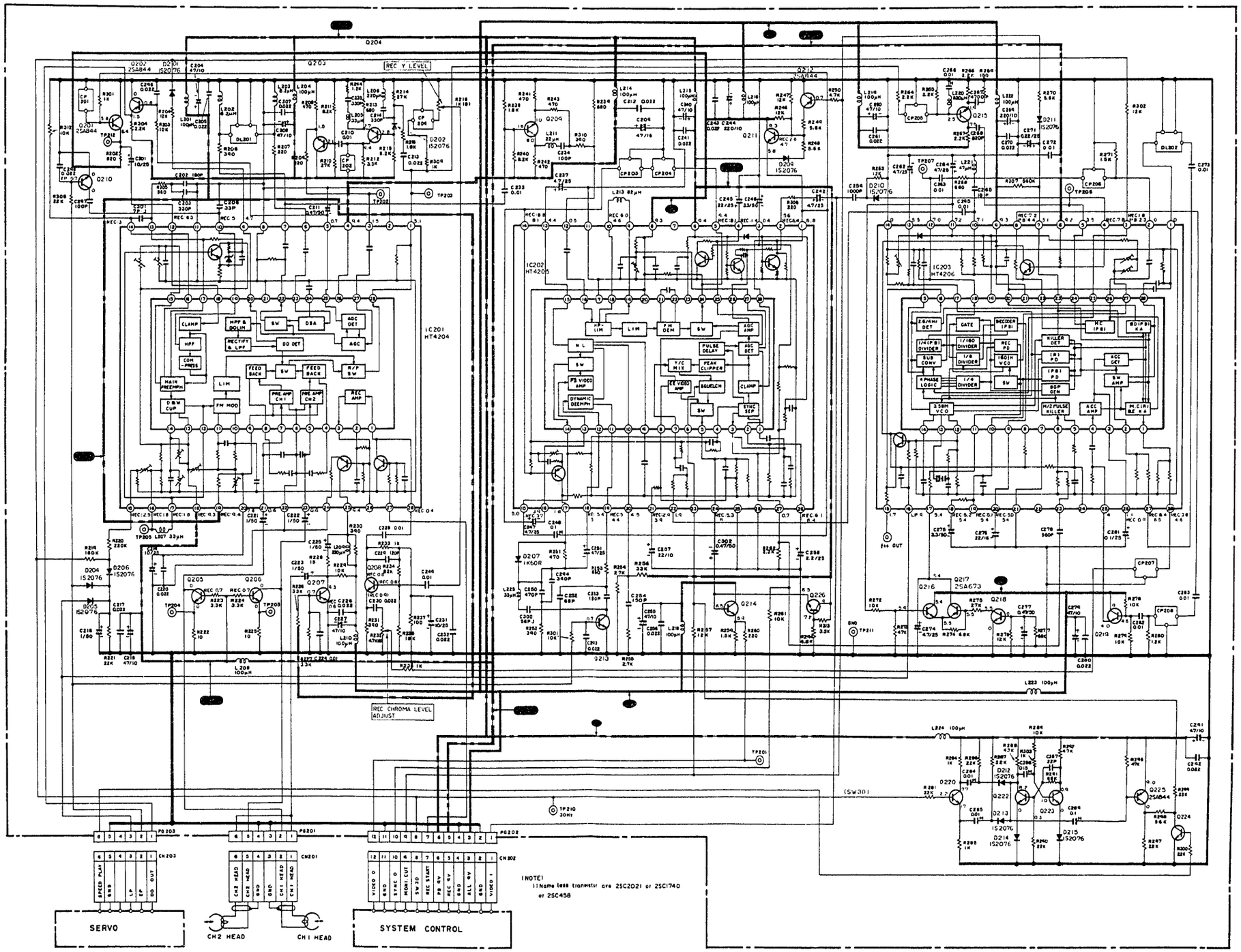
PG2003

1	PS/MEMORY
2	LED STOP
3	LED PAUSE
4	LED REW
5	LED FF
6	LED DUB
7	LED REC
8	LED P.B.
9	GND

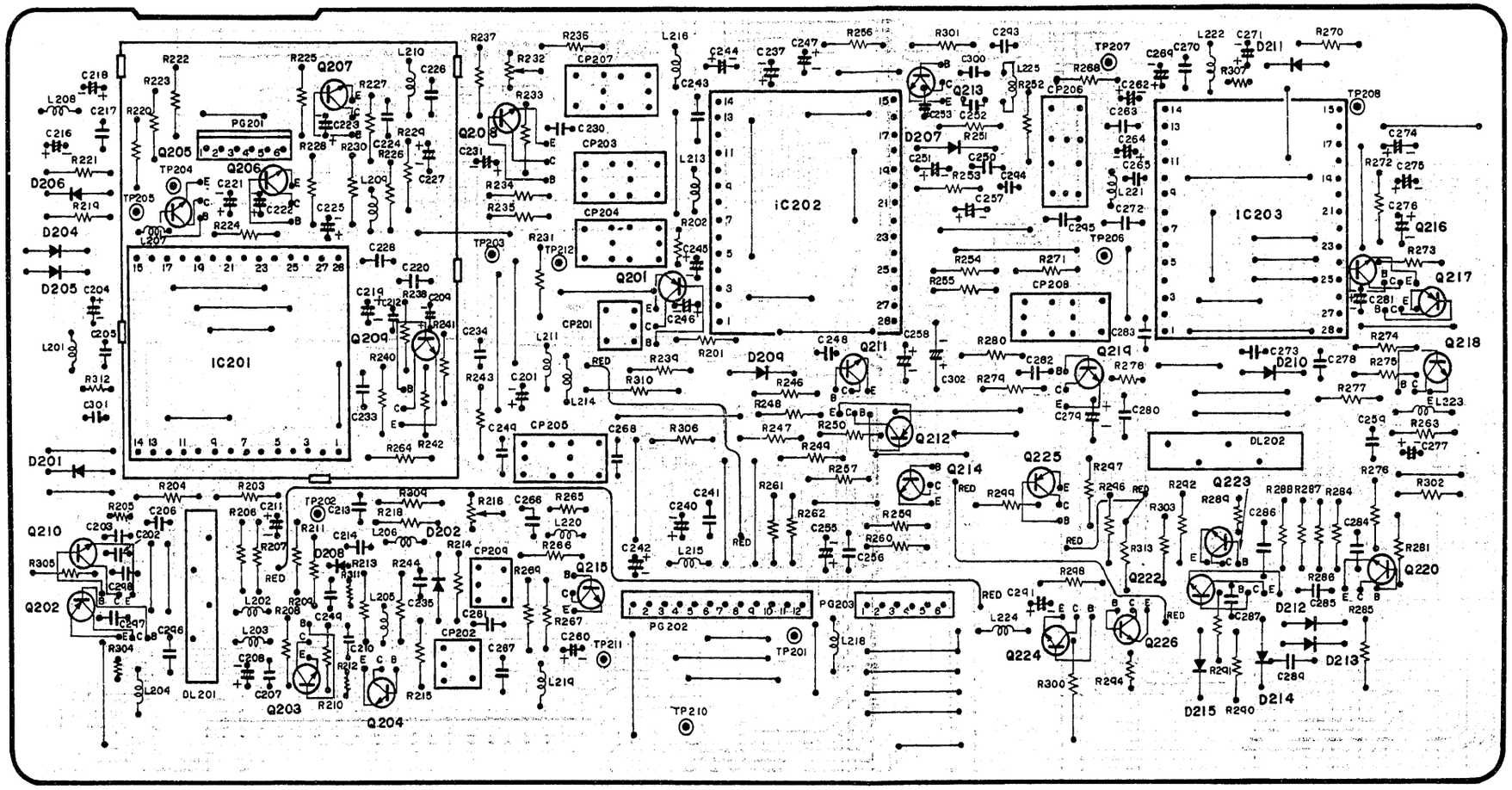
PG2004

1	LP
2	SP/LP/EP
3	EP
4	PB 9V
5	PB

WYC (LUMINANCE AND CHROMA) SCHEMATIC DIAGRAM



WYC (LUMINANCE AND CHROMA) CIRCUIT BOARD DIAGRAM



IC203 (REC)

1	(0)	5	3.5	9		13	5.5	17	5.4	21		25	4.0
2	(0)	6	9.2	10	7.1	14	0	18	5.4 (5.2)	22		26	1.1 (0.5)
3	2.3 (1.8)	7	5.1	11	7.2	15	1.7	19	5.4 (5.1)	23		27	6.5 (8.4)
4	(7.8)	8	4.4	12	7.0	16	9.0	20	5.4 (5.0)	24		28	4.6 (3.8)

PG201

1	CH1 HEAD
2	CH1 HEAD
3	GND
4	GND
5	CH2 HEAD
6	CH2 HEAD

PG202

1	VIDEO IN
2	GND
3	AkL 9V
4	GND
5	REC 9V
6	PB 9V
7	REC START
8	SW30
9	MONITOR CUT
10	SYNC OUT
11	GND
12	VIDEO OUT

PG203

1	DO OUT
2	EP
3	LP
4	
5	GND
6	SPEED PLAY

Q201

E	6.4
B	5.8
C	0

Q202

E	1.5
B	0.8
C	0

Q203

E	1.5
B	2.1
C	9.4

Q204

E	2.7
B	2.8
C	9.4

Q205

	REC
E	0
B	0.7
C	0

Q206

	REC
E	0
B	0.7
C	0

Q207

	REC
E	0
B	0.7
C	1.6

Q208

	REC
E	0.9
B	0.6
C	0.8

Q209

E	1.0
B	1.6
C	1.0

W210

	EP
E	0
B	0.7
C	0

Q211

	REC
E	5.8
B	2.6
C	9.3

Q212

	MONI CUT
E	0
B	0.7
C	—

Q213

	LP
E	0
B	0.7
C	0

Q214

E	9.0
B	6.5
C	5.9

Q215

E	1.9
B	2.5
C	7.5

Q216

E	5.5
B	5.9
C	5.4

Q217

E	5.5
B	5.5
C	5.4

Q218

E	0
B	0
C	5.5

Q219

E	4.0
B	4.6
C	9.0

Q220

E	1.7
B	2.2
C	7.7

Q222

E	0
B	0.3
C	8.2

Q223

E	0
B	1.0
C	0.9

Q225

E	9.0
B	—
C	0

IC201 (REC)

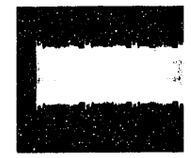
1	5.1	5	0.7	9	9.4	13		17	(1.8)	21	0.6	25	9.4
2		6		10	(5.0)	14	(3.0)	18	(9.3)	22		26	
3	1.5	7		11		15	(2.5)	19	(9.4)	23	(0.6)	27	
4	9.4	8		12	(6.3)	16	(1.8)	20	7.8	24		28	(0.4)

IC202 (REC)

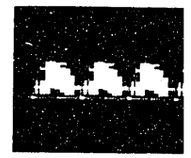
1	5.8	5	9.4 (8.1)	9		13	4.4	17	1.8 (3.7)	21	3.9 (2.9)	25	
2	5.6 (6.4)	6	9.4	10	4.6 (6.0)	14	8.1 (8.8)	18	5.0 (5.4)	22	1.9	26	
3	0.4	7		11		15	5.0	19	4.4 (5.0)	23		27	0.7
4	(1.4)	8	9.3	12	0.5	16	3.9	20	4.5	24	6 (5.3)	28	8.4 (6.1)

Y/CHROMA WAV

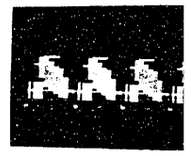
TP204, 205
50mV/20μs.div.



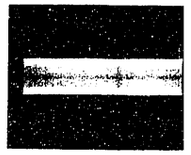
TP201 REC
1V/20μs.div.



IC202-②STOP
0.5V/20μs.div.



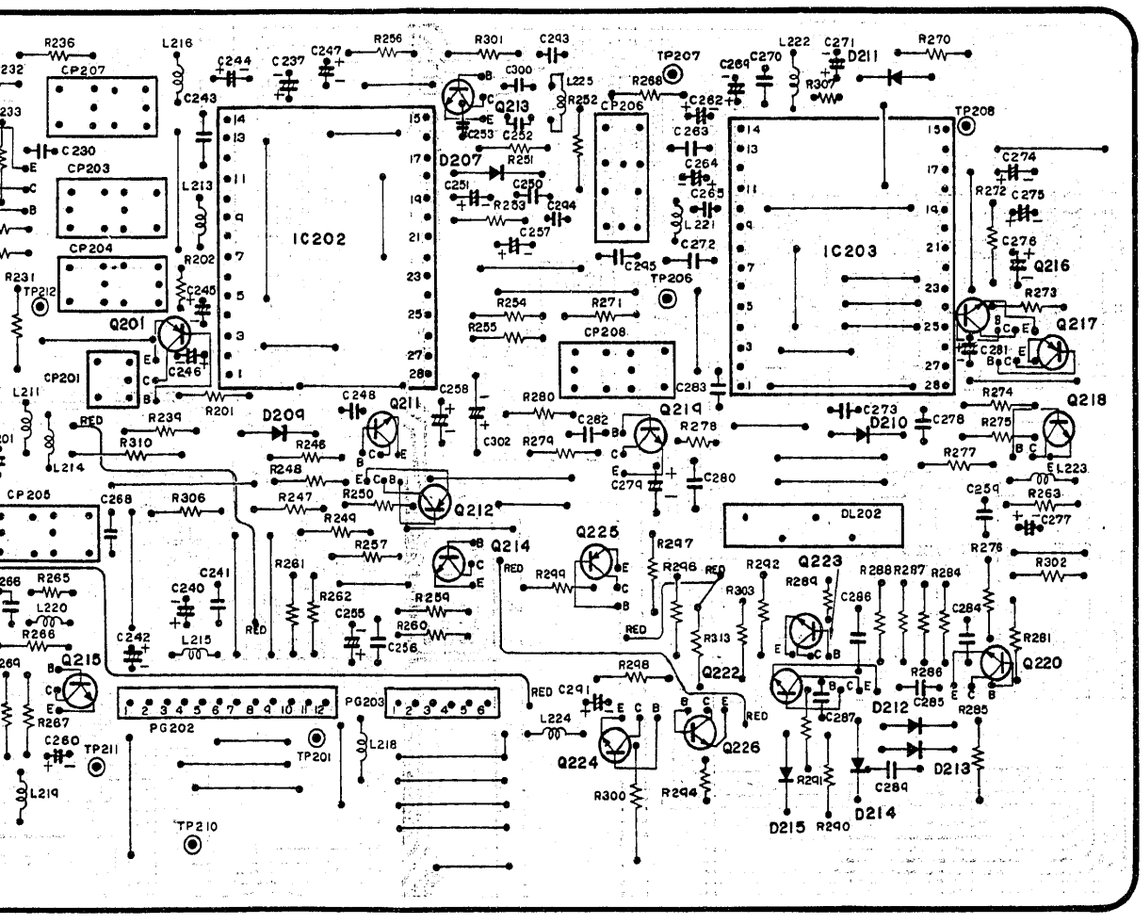
TP203 REC
0.5V/20μs.div.



IC202 (21) PB
2V/20μs.div.

IC203 (REC)

1	(0)	5	3 5	9		13	5 5	17	5 4	21		25	4 0
2	(0)	6	9 2	10	7 1	14	0	18	5 4 (5 2)	22		26	1 1 (0 5)
3	2 3 (1 8)	7	5 1	11	7 2	15	1 7	19	5 4 (5 1)	23		27	6 5 (8 4)
4	(7 8)	8	4 4	12	7 0	16	9 0	20	5 4 (5 0)	24		28	4 6 (3 8)



PG201

1	CH1 HEAD
2	CH1 HEAD
3	GND
4	GND
5	CH2 HEAD
6	CH2 HEAD

PG202

1	VIDEO IN
2	GND
3	ALL 9V
4	GND
5	REC 9V
6	PB 9V
7	REC START
8	SW30
9	MONITOR CUT
10	SYNC OUT
11	GND
12	VIDEO OUT

PG203

1	DO OUT
2	EP
3	LP
4	
5	GND
6	SPEED PLAY

Q207

	REC
E	0
B	0.7
C	1.6

Q208

	REC
E	0.9
B	0.6
C	0.8

Q209

E	1.0
B	1.6
C	1.0

W210

	EP
E	0
B	0.7
C	0

Q211

	REC
E	5.8
B	2.6
C	9.3

Q212

	MONI CUT
E	0
B	0.7
C	—

Q213

	LP
E	0
B	0.7
C	0

Q214

E	9.0
B	6.5
C	5.9

Q215

E	1.9
B	2.5
C	7.5

Q216

E	5.5
B	5.9
C	5.4

Q217

E	5.5
B	5.5
C	5.4

Q218

E	0
B	0
C	5.5

IC201 (REC)

5	0 7	9	9 4	13		17	(1 8)	21	0 6	25	9.4
6		10	(5 0)	14	(3 0)	18	(9 3)	22		26	
7		11		15	(2 5)	19	(9 4)	23	(0 6)	27	
8		12	(6 3)	16	(1 8)	20	7 8	24		28	(0 4)

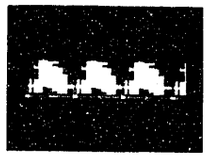
IC202 (REC)

1	5 8	5	9 4 (8 1)	9		13	4 4	17	1 8 (3 7)	21	3 9 (2 9)	25	
2	5 6 (6 4)	6	9 4	10	4 6 (6 0)	14	8 1 (8 8)	18	5 0 (5 4)	22	1 9	26	
3	0 4	7		11		15	5 0	19	4.4 (5.0)	23		27	0.7
4	(1 4)	8	9 3	12	0 5	16	3 9	20	4 5	24	6 (5 3)	28	8 4 (6 1)

Y/CHROMA WAVEFORMS

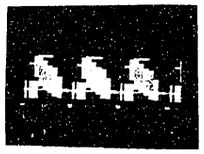
TP204, 205
50mV/20μs.div.

TP201 REC
1V/20μs.div.

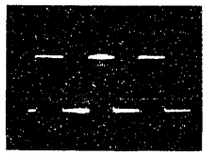


TP201 PB
0.5V/20μs.div.

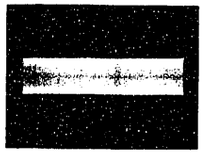
IC202-②STOP
0.5V/20μs.div.



TP210 PB/REC
2V/10μs.div.

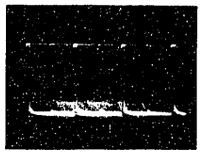


TP203 REC
0.5V/20μs.div.

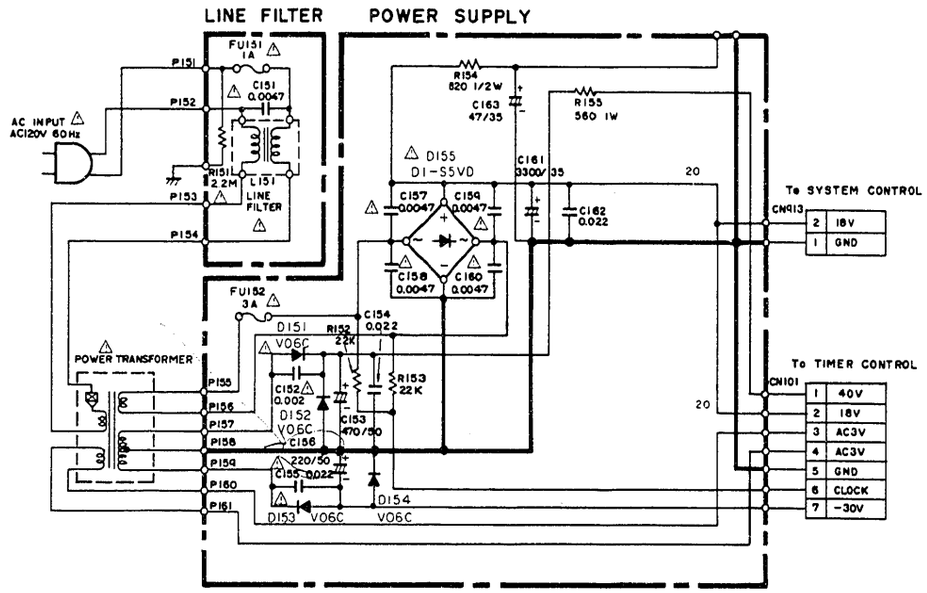


TP203 PB
SP 0.2V/5ms.div.

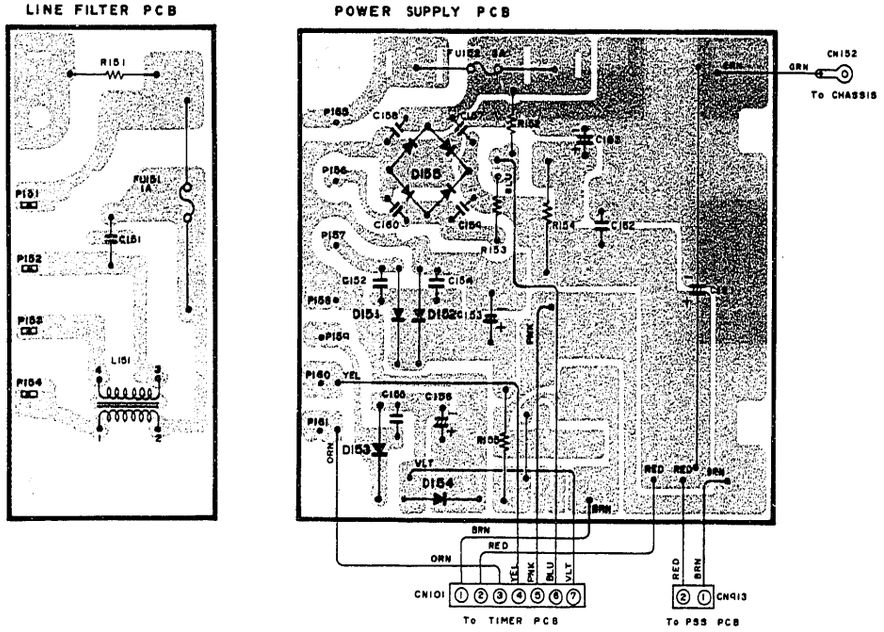
IC202 (77) PB
2V/20μs.div.



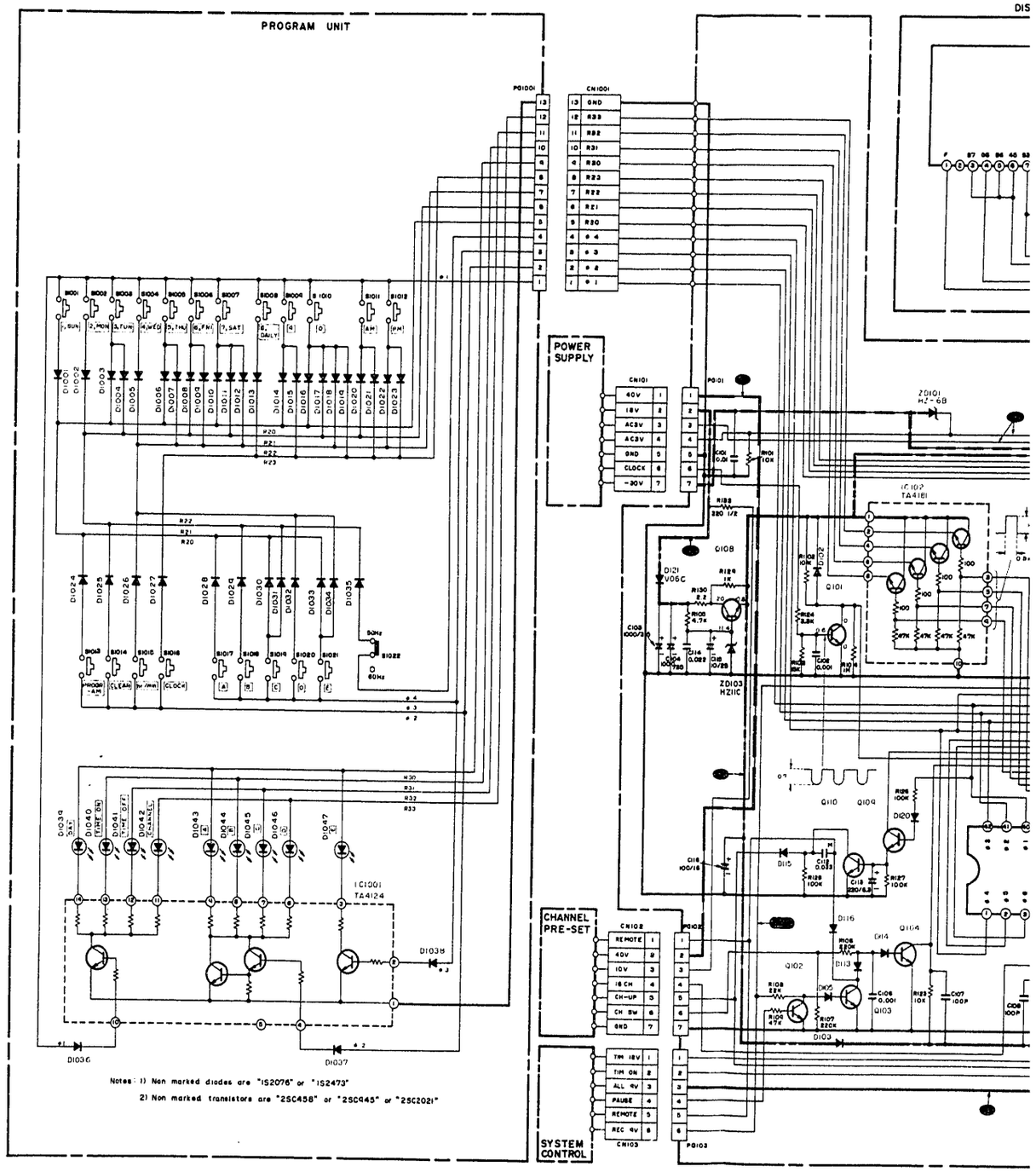
POWER SUPPLY SCHEMATIC DIAGRAM



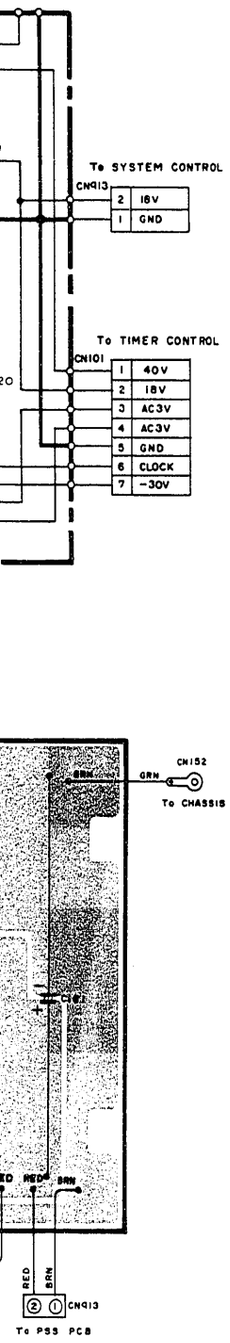
POWER SUPPLY CIRCIT BOARD DIAGRAM

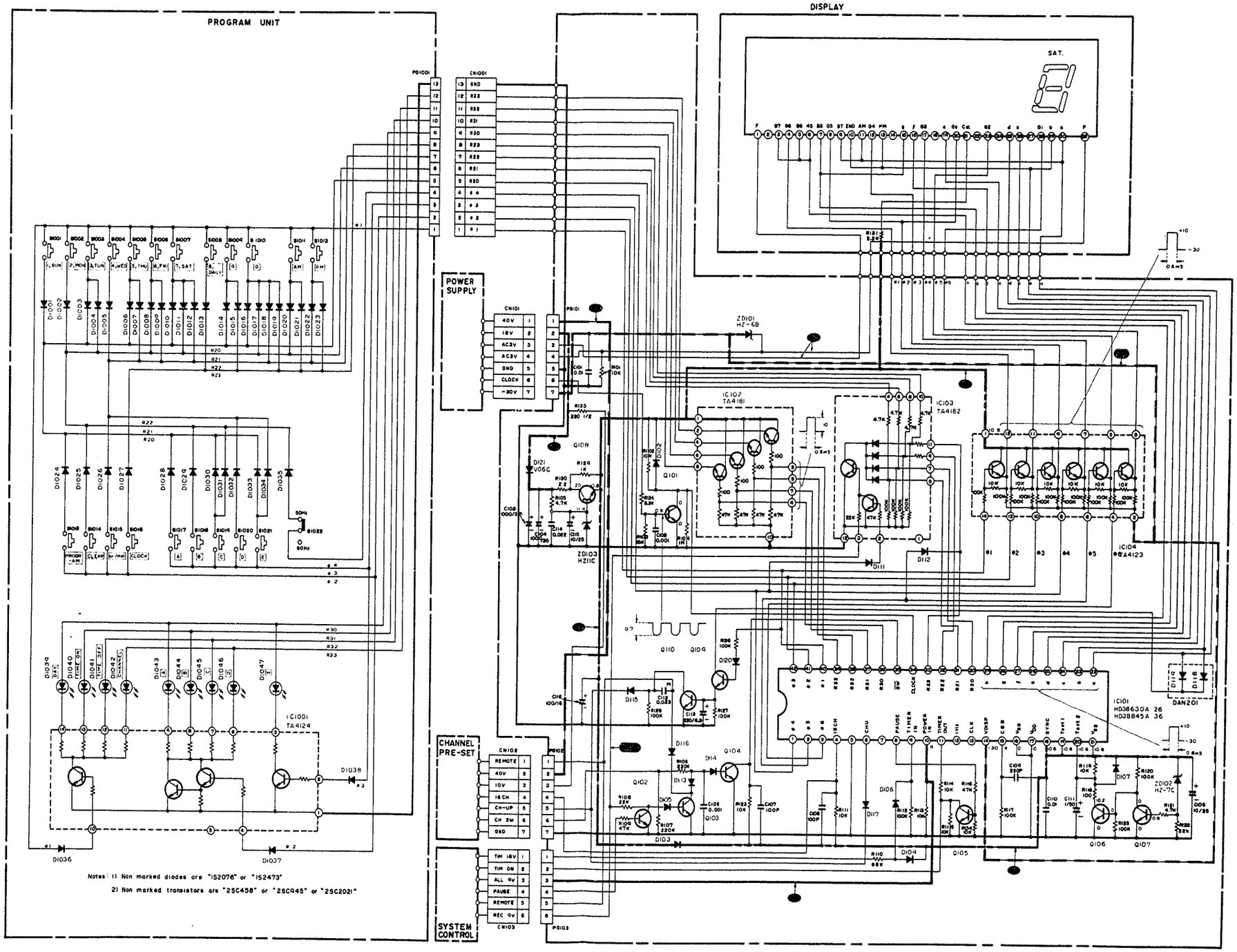


TIMER CONTROL SCHEMATIC DIAGRAM

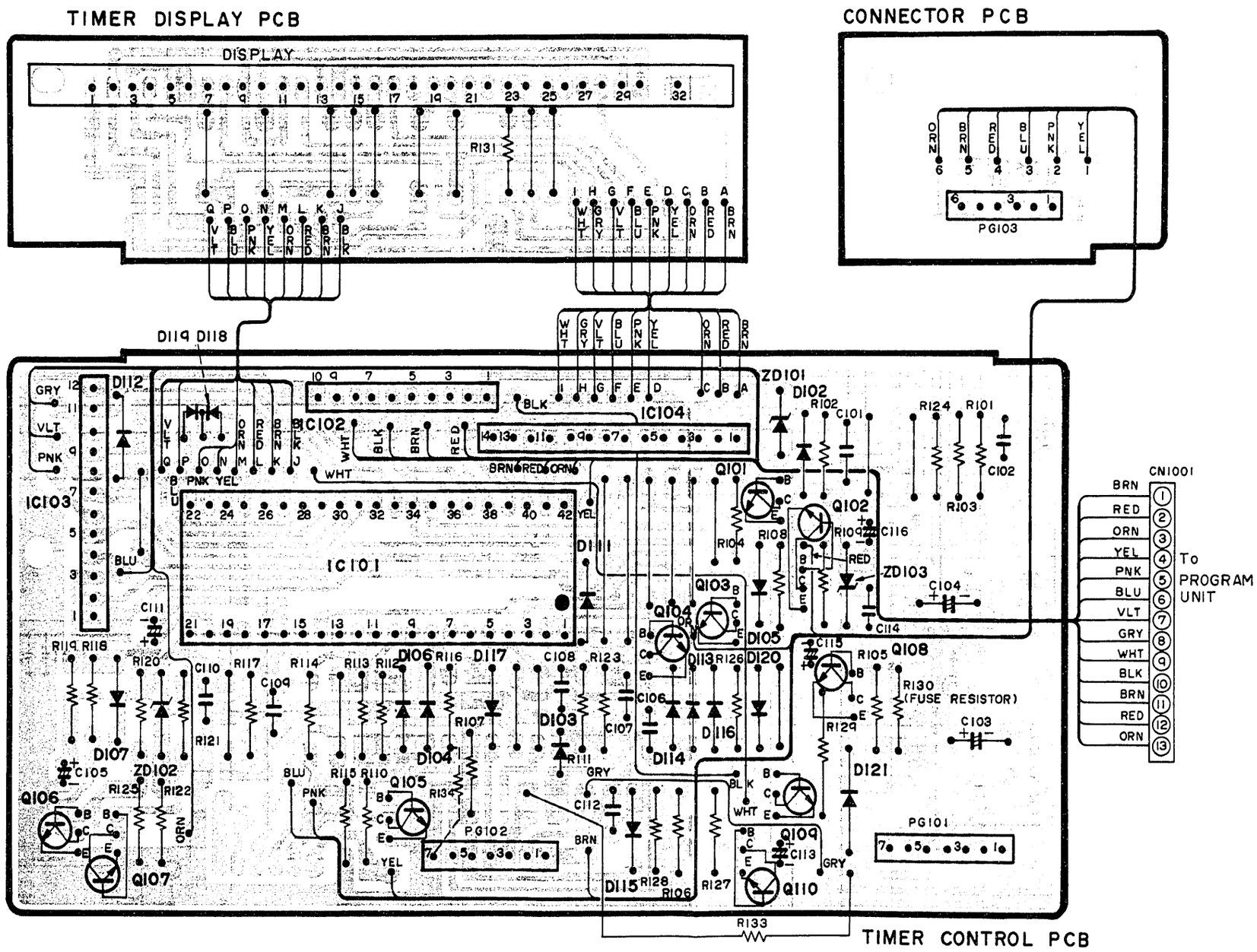


TIMER CONTROL SCHEMATIC DIAGRAM





TIMER CONTROL CIRCUIT BOARD DIAGRAM



PG101

1	40V
2	18V
3	AC3V
4	AC3V
5	GND
6	CLOCK
7	-30V

(G102

1	REMOTE
2	40V
3	10V
4	16CH
5	CH-UP
6	CH-SW
7	GND

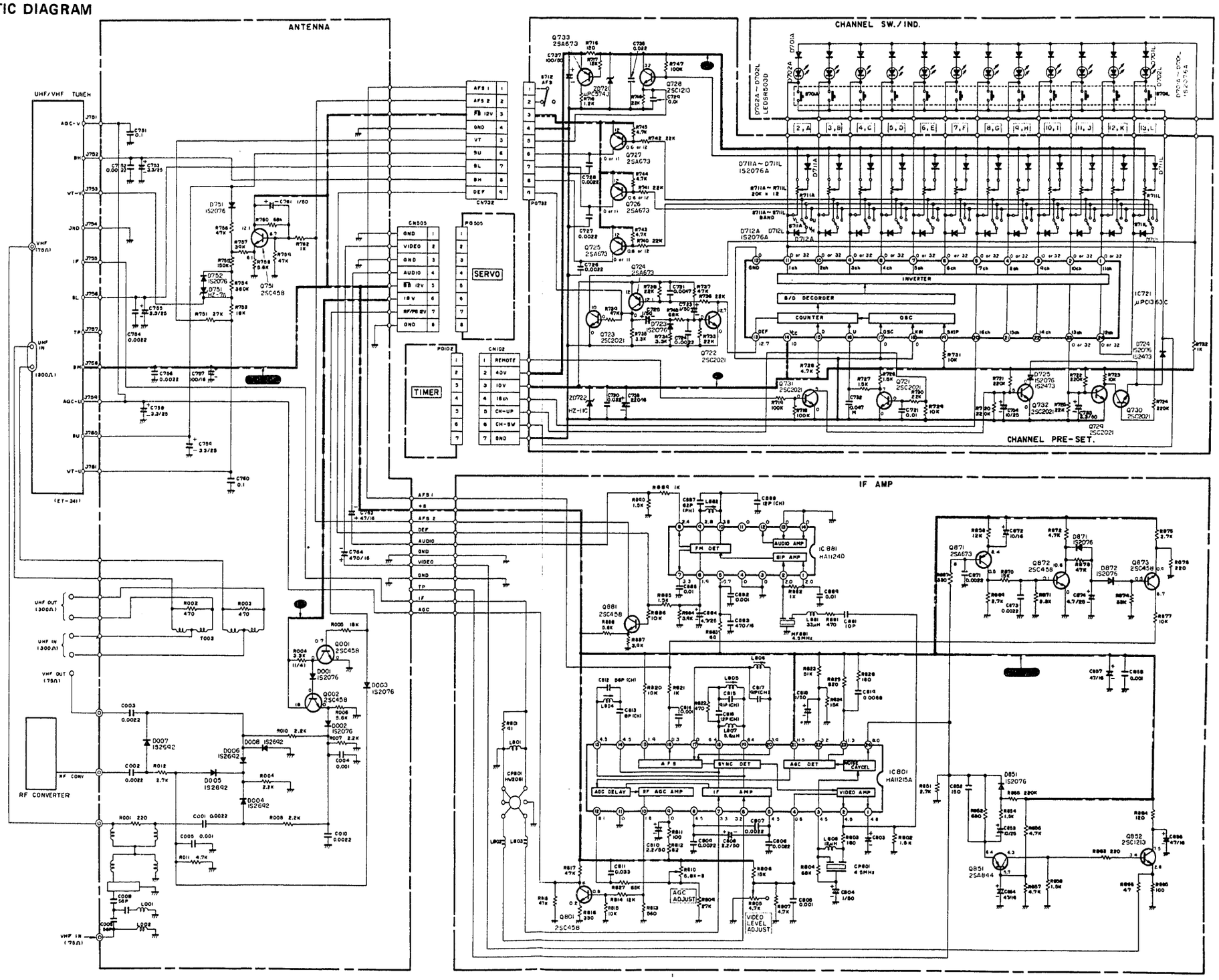
PG103

1	TIMER 18V
2	TIMER ON
3	ALL 9V
4	PAUSE
5	REMOTE
6	REC 9V

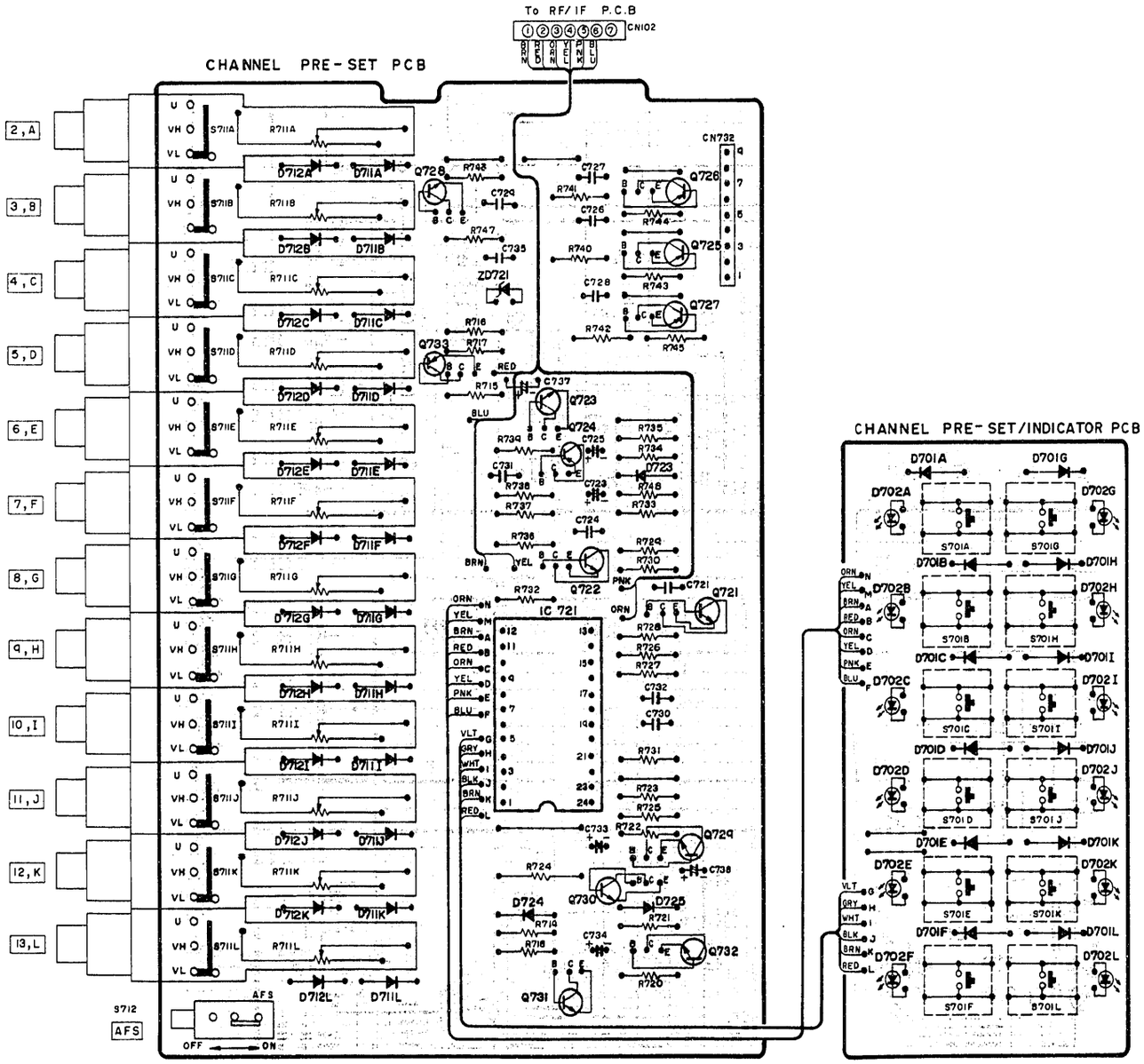
CN1001

1	φ1
2	φ2
3	φ3
4	φ4
5	R20
6	R21
7	R22
8	R23
9	R30
1-	R31
11	R32
12	R33
13	GND

RF-IF SCHEMATIC DIAGRAM



RF-IF BLOCK CIRCUIT BOARD DIAGRAM



IC721

1	0/32	5	0/32	9	0/32	13	12.7	17		21	
2	0/32	6	0/32	10	0/32	14	10	18		22	
3	0/32	7	0/32	11	0/32	15		19		23	0/32
4	0/32	8	0/32	12	0	16		20		24	0/32

IC801

1	4.8	5	4.5	9	0	13	4.5	17	0	21	1.5
2	4.5	6	3.2	10	1.8	14	4.5	18	6.4	22	3.2
3	4.5	7	3.3	11	0	15	1.9	19	6.4	23	11.3
4	0.6	8	4.5	12	8.1	16	0.3	20	3.9	24	8.0

IC881

1	2.0	5	10.1	9	2.8	13	0
2	2.0	6	1.9	10	3.8	14	0
3	0	7	3.3	11	0	15	
4	0	8	2.4	12	0	16	

PG102

1	REMOTE
2	40V
3	10V
4	16CH
5	CH-UP
6	CH-SW
7	GND

CN505

1	GND
2	VIDEO OUT
3	GND
4	AUDIO OUT
5	PB 12V
6	18V
7	RF/PB 12V
8	GND

Q001

E	0
B	0.7
C	0

Q002

E	0
B	0
C	18

Q751

E	6.1
B	6.7
C	12.1

Q801

E	0.2
B	0.8
C	6.0

Q851

E	6.4
B	5.7
C	4.3

Q852

E	2.8
B	3.4
C	7.5

Q871

E	8.4
B	8
C	0.5

Q721

E	0
B	0
C	7

Q722

E	0
B	0
C	12.7

Q723

E	0
B	0
C	10

Q724

E	12
B	12.1
C	0

Q725

E	12
B	0.6/12
C	0/11

Q726

E	12
B	0.6/12
C	0/11

Q727

E	12
B	0.6/12
C	0/11

Q728

E	--
B	--
C	32

Q729

E	
B	
C	

Q730

E	
B	
C	

Q731

E	0
B	0
C	5

Q732

E	0
B	5
C	0

Q733

E	
B	
C	

Q872

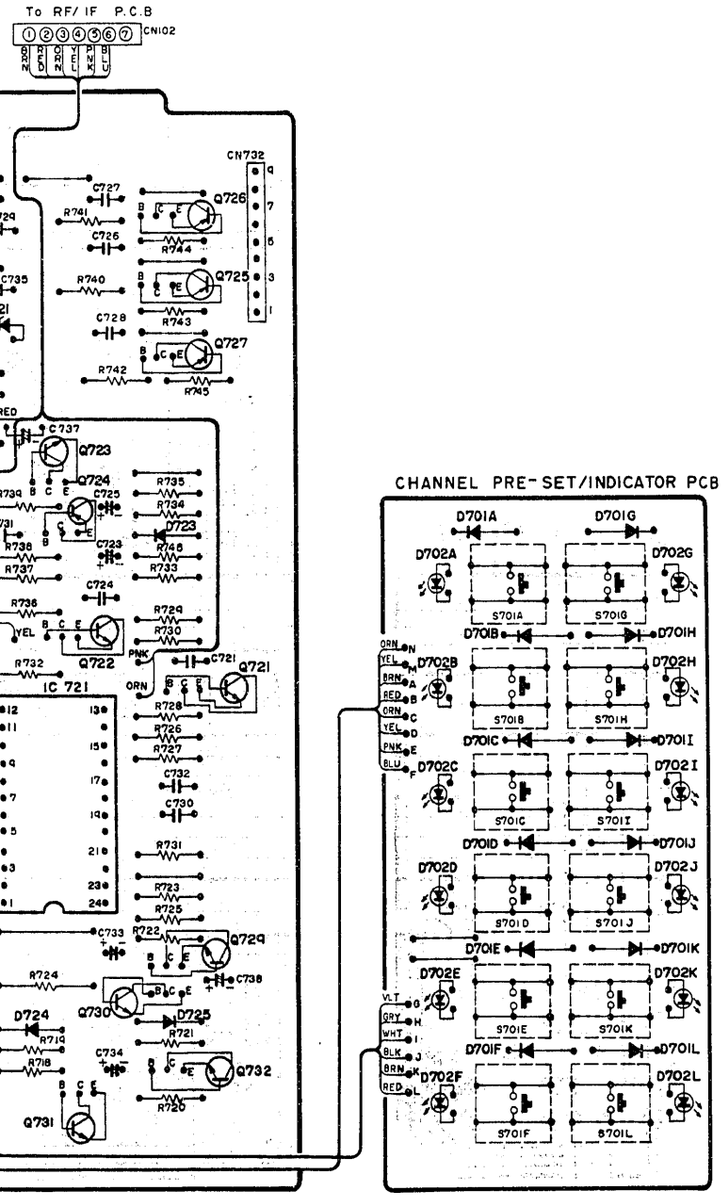
E	0
B	0.1
C	10.6

Q873

E	0.9
B	0.5
C	6.7

Q881

E	
B	
C	



IC721

1	0/32	5	0/32	9	0/32	13	12.7	17		21	
2	0/32	6	0/32	10	0/32	14	10	18		22	
3	0/32	7	0/32	11	0/32	15		19		23	0/32
4	0/32	8	0/32	12	0	16		20		24	0/32

IC801

1	4.8	5	4.5	9	0	13	4.5	17	0	21	1.5
2	4.5	6	3.2	10	1.8	14	4.5	18	6.4	22	3.2
3	4.5	7	3.3	11	0	15	1.9	19	6.4	23	11.3
4	0.6	8	4.5	12	8.1	16	0.3	20	3.9	24	8.0

IC881

1	2.0	5	10.1	9	2.8	13	0
2	2.0	6	1.9	10	3.8	14	0
3	0	7	3.3	11	0	15	
4	0	8	2.4	12	0	16	

PG102

1	REMOTE
2	40V
3	10V
4	16CH
5	CH-UP
6	CH-SW
7	GND

CN505

1	GND
2	VIDEO OUT
3	GND
4	AUDIO OUT
5	$\overline{PB}$ 12V
6	18V
7	RF/PB 12V
8	GND

Q001

E	0
B	0.7
C	0

Q002

E	0
B	0
C	18

Q751

E	6.1
B	6.7
C	12.1

Q801

E	0.2
B	0.8
C	6.0

Q851

E	6.4
B	5.7
C	4.3

Q852

E	2.8
B	3.4
C	7.5

Q871

E	8.4
B	8
C	0.5

Q726

	2
	0.6/12
	0/11

Q727

E	12
B	0.6/12
C	0/11

Q728

E	–
B	–
C	32

Q729

E	
B	
C	

Q730

E	
B	
C	

Q731

E	0
B	0
C	5

Q732

E	0
B	5
C	0

Q733

E	
B	
C	

Q872

E	0
B	0.1
C	10.6

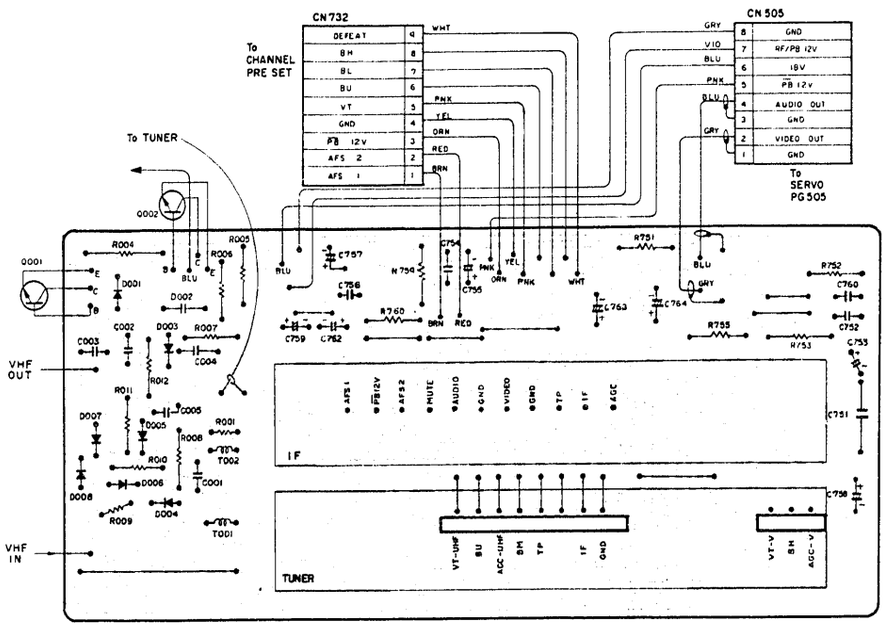
Q873

E	0.9
B	0.5
C	6.7

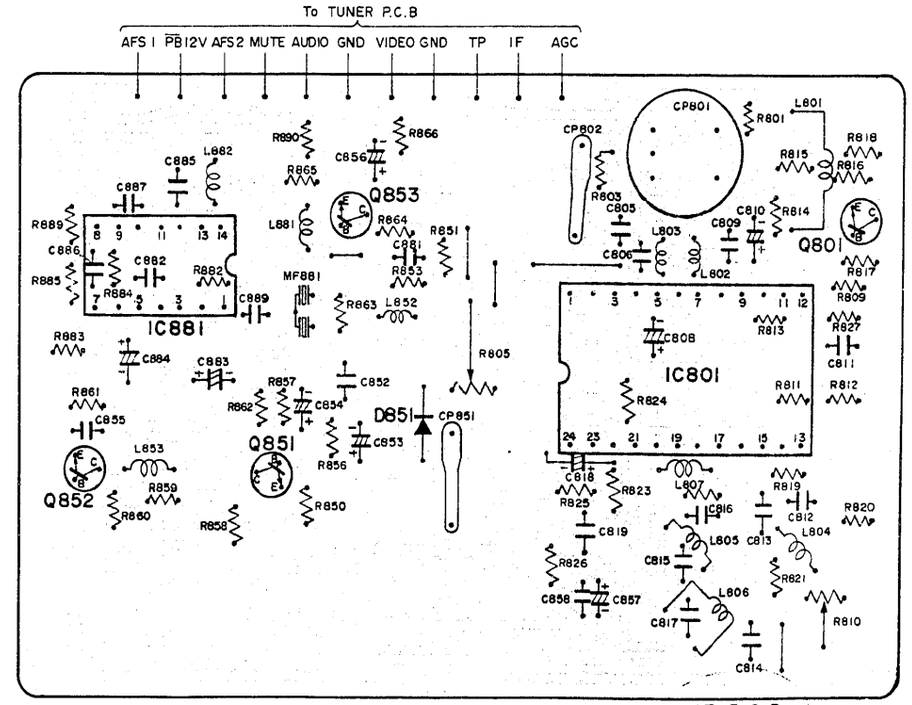
Q881

E	
B	
C	

TUNER/IF CIRCUIT BOARD DIAGRAM

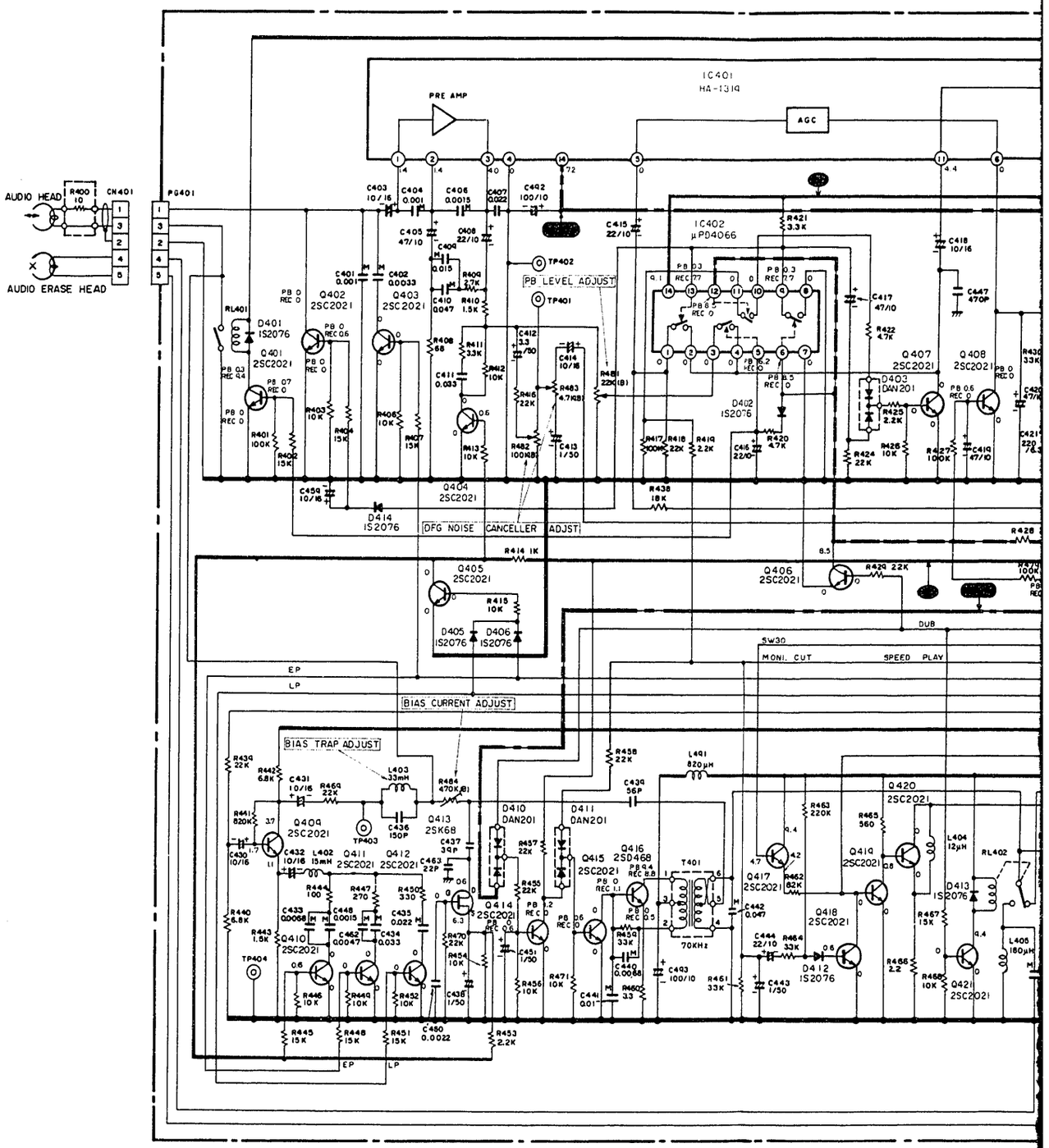


TUNER P.C.B

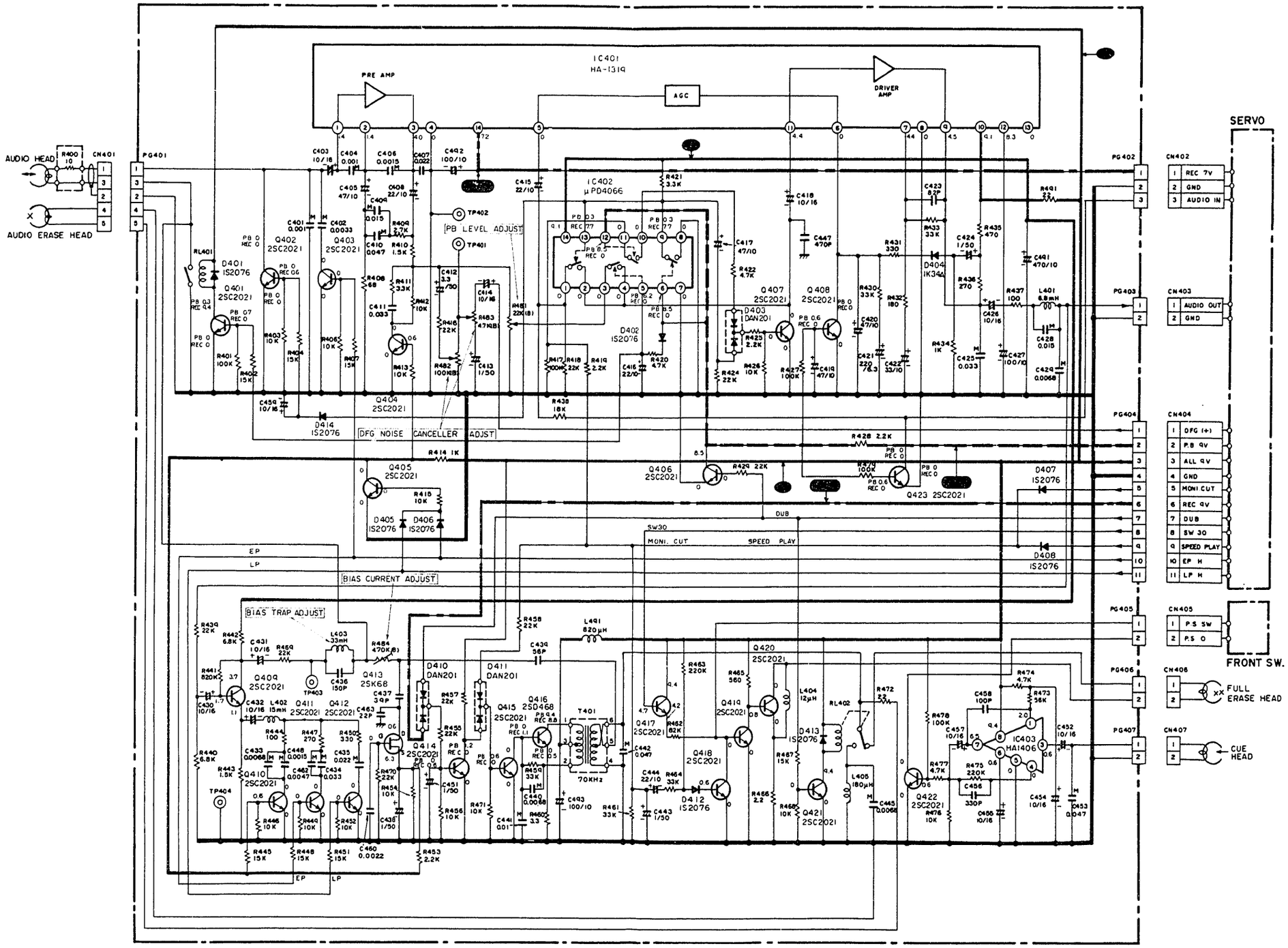


IF P.C.B

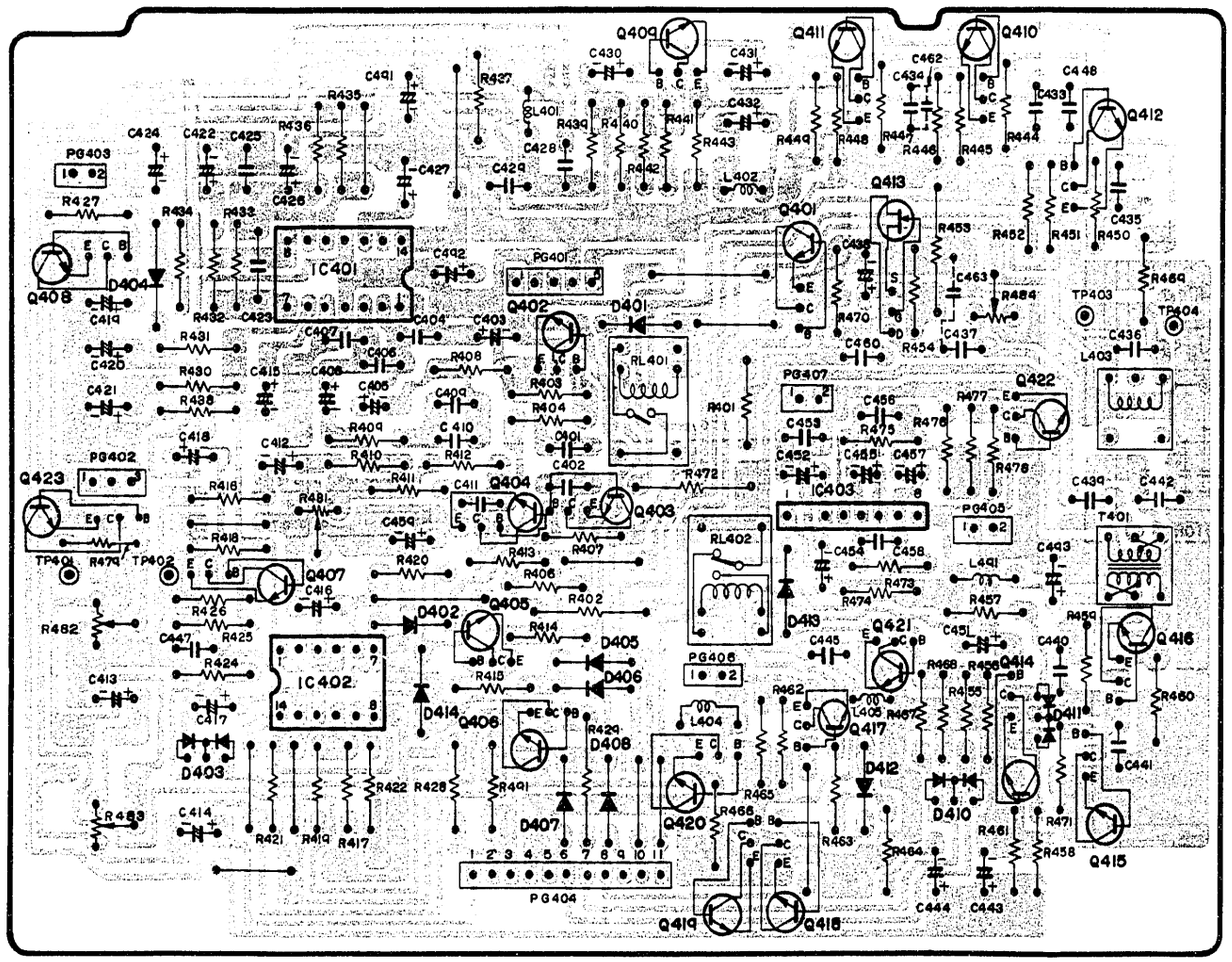
AUDIO SCHEMATIC DIAGRAM



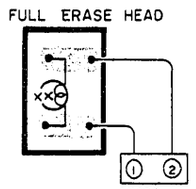
AUDIO SCHEMATIC DIAGRAM



AUDIO CIRCUIT BOARD DIAGRAM



AUDIO PCB



PG401

1	AUDIO HEAD
2	AUDIO HEAD
3	GND
4	A. ERASE HEAD
5	A. ERASE HEAD

PG402

1	REC 7V
2	GND
3	AUDIO IN

PG403

1	AUDIO OUT
2	GND

PG404

1	DFG (+)
2	P.B. 9V
3	ALL 9V
4	GND
5	MONI CUT
6	REC 9V
7	DUB
8	SW30
9	SPEED PLAY
10	EP H
11	LP H

PG405

1	PS SW
2	PS OUT

PG406

1	FE HEAD
2	FE HEAD

PG407

1	CUE HEAD
2	GND

IC401

1	1.4	5	0	9	4.5	13	0
2	1.4	6	0	10	9.1	14	7.2
3	4.0	7	4.4	11	4.4	15	
4	0	8	0	12	8.3	16	

IC402 (P.B. (REC))

1	0	5	6.2 (0)	9	0.3 (7.7)	13	0.3 (7.7)
2	0	6	0 (8.5)	10	0	14	9.1 (9.1)
3	0	7	0	11	0	15	
4	0	8	0	12	0 (8.5)	16	

IC403

1	2.0	5	0
2	–	6	0.6
3	0.6	7	6.5
4	0	8	9.4

Q401

	PB (REC)
E	0
B	0.7 (0)
C	0.3 (4.4)

Q402

	PB (REC)
E	0
B	0 (0.6)
C	0

Q403

	LP.SP (EP)
E	0
B	0 (0.6)
C	0

Q404

	LP.EP (SP)
E	0
B	0 (0.6)
C	0

Q405

	LP.EP (SP)
E	0
B	0.6 (0)
C	0 (9)

Q406

	DUB
E	0
B	0.6
C	0

Q407

	MUTE ON
E	0
B	0.6
C	0

Q408

	PB (REC)
E	0
B	0.6 (0)
C	0

Q409

	REC
E	1.1
B	1.7
C	3.7

Q410

	EP.LP (SP)
E	0
B	0 (0.6)
C	0

Q411

	SP.LP (EP)
E	0
	0 (0.6)
C	0

Q412

	SP.EP (LP)
E	0
B	0 (0.6)
C	0

Q413

	REC
D	6.3
B	0
C	0.6

Q414

	PB (REC)
E	0
B	0 (0.6)
C	0

Q415

	PB (REC)
E	0
B	0.6 (0)
C	0

Q416

	PB (REC)
E	0 (0.5)
B	0 (1.1)
C	9.4 (8.8)

Q417

	P.B.
E	4.2
B	4.7
C	9.4

Q418

	CUE
E	0
B	0.6
C	0

Q419

	CUE
E	0
B	0
C	0

Q420

	REC
E	0
B	0.6
C	0

Q421

	REC (DUB)
E	0
B	0 (0.6)
C	9.4 (0)

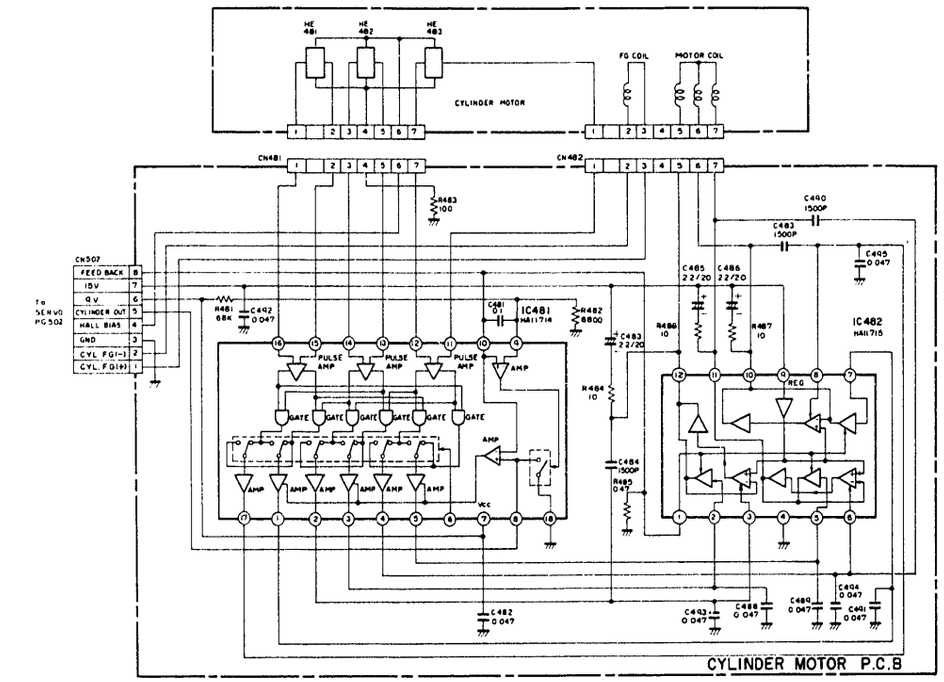
Q422

	P.B.
E	0
B	0.6
C	0

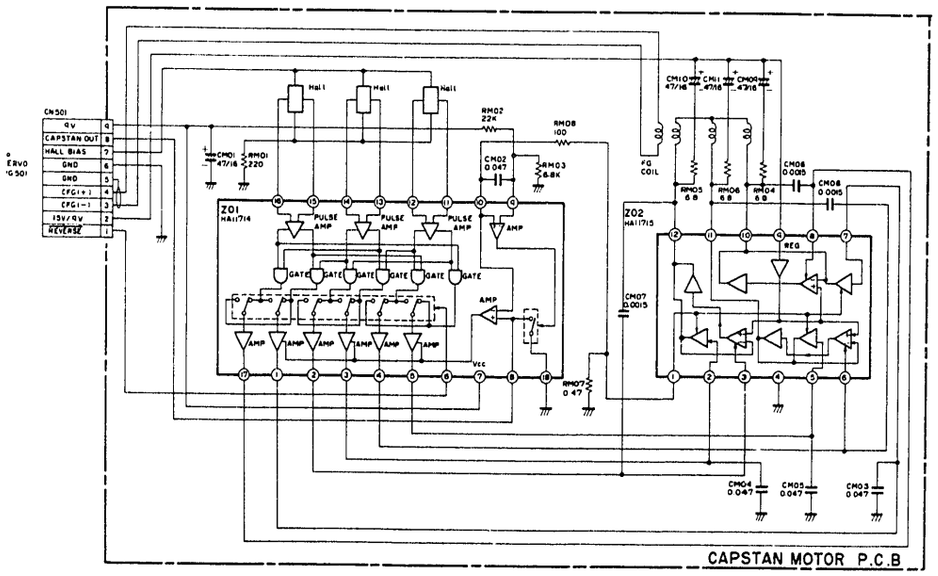
Q423

	DUB
E	0
B	0.6
C	0

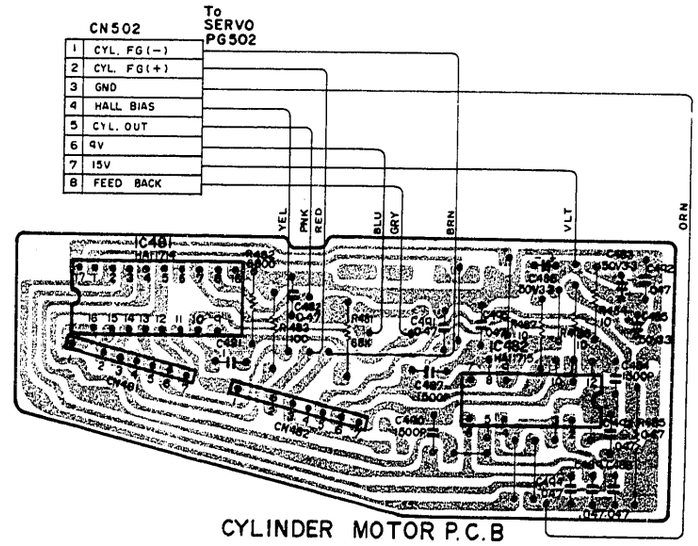
CYLINDER MOTOR SCHEMATIC DIAGRAM



CAPSTAN MOTOR SCHEMATIC DIAGRAM
(Capstan motor PC Board Part No. 5576743)



CYLINDER MOTOR CIRCUIT BOARD DIAGRAM



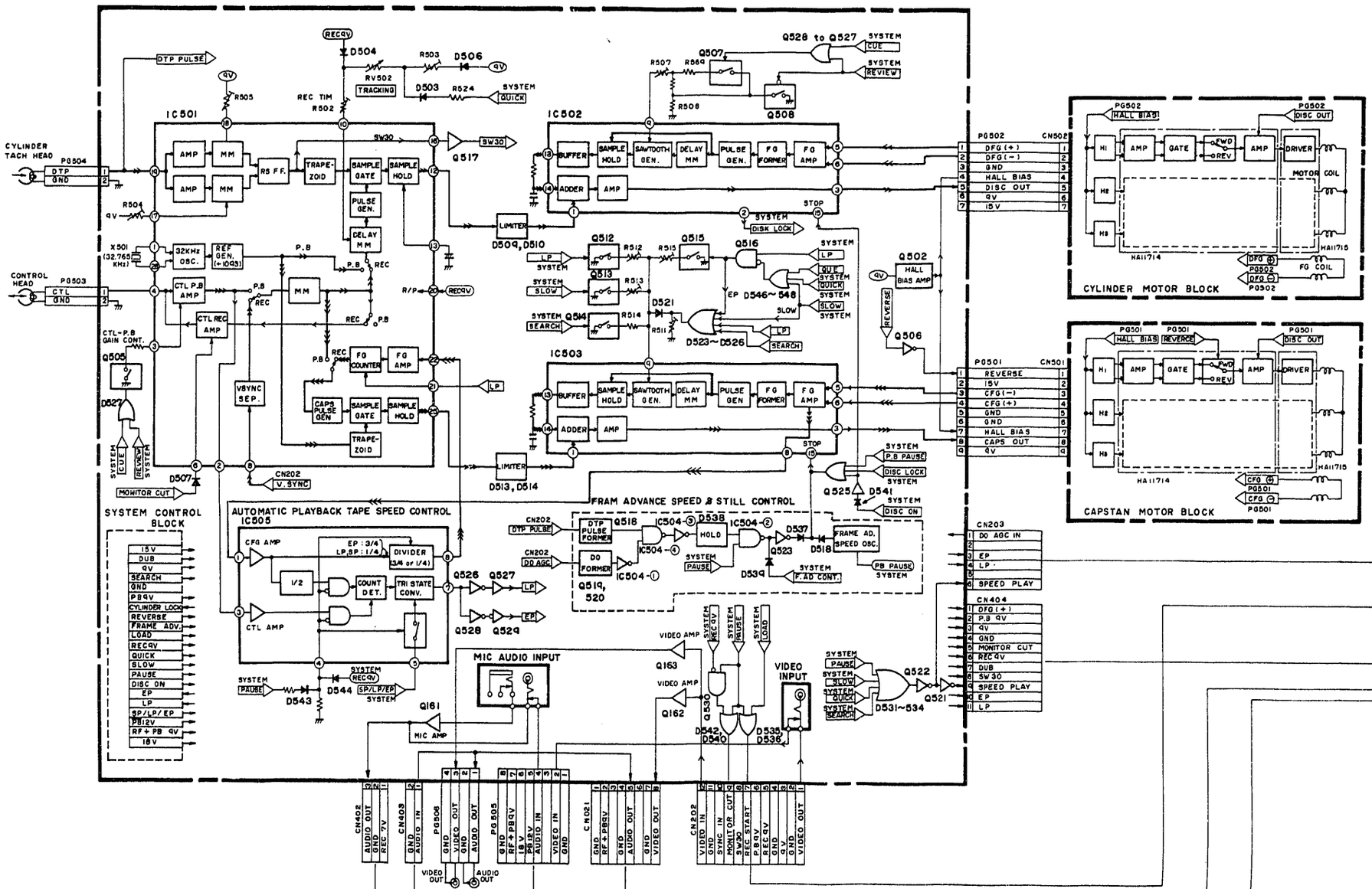
IC481

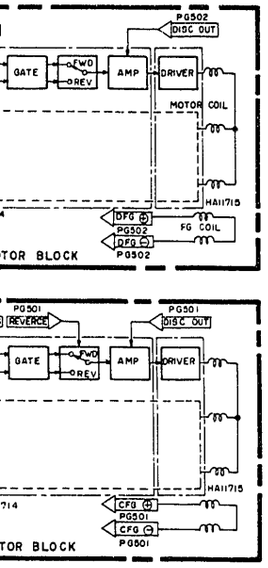
17	1	2	3	4	5	6	7	8	18
3.7(3.7)	1 (1)	3.7(3.7)	1 (1)	3.7(3.7)	1 (1)	0 (0)	9 (9)	4.5(4.5)	0(0)
	16	15	14	13	12	11	10	9	
	1.6(1.6)	1.6 (1.6)	1.6(1.6)	1.6(1.6)	1.6(1.6)	1.6(1.6)	0.1(0.1)	1 (1)	

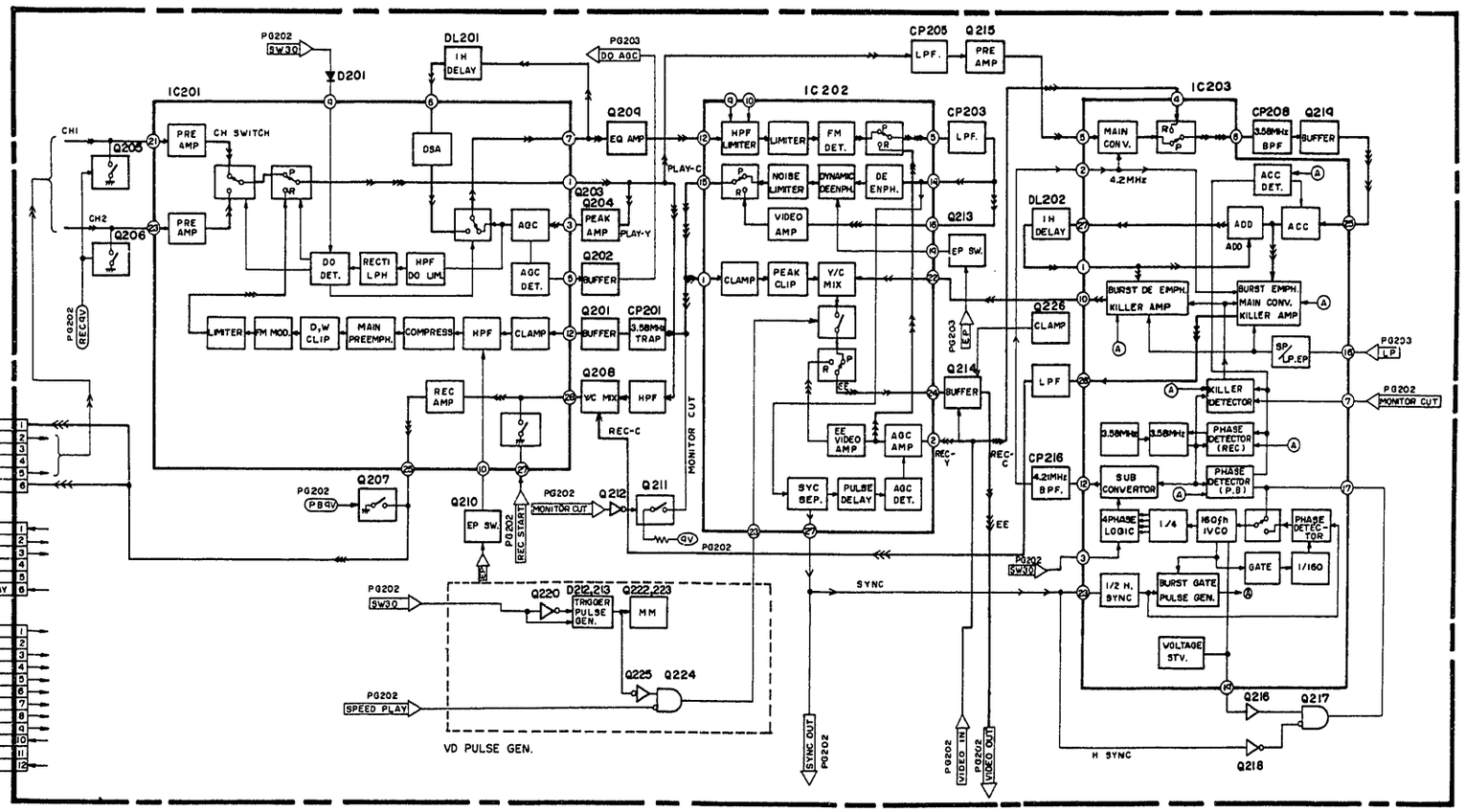
IC482

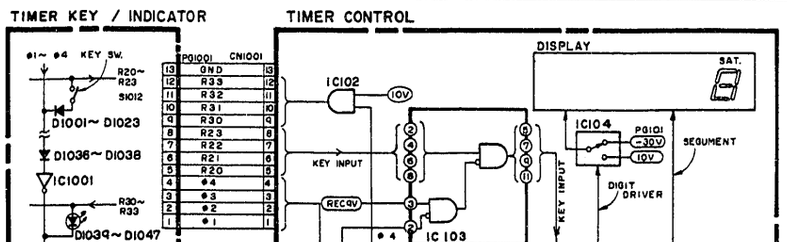
7	8	9	10	11	12
1 (1)	3.7(3.7)	9 (9)	5 (5)	5 (5)	5 (5)
6	5	4	3	2	1
3.7(3.7)	1 (1)	0 (0)	3.7(3.7)	1 (1)	0 (0)

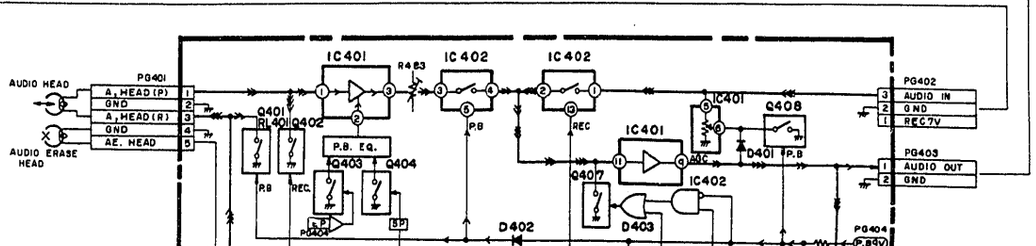
OVERALL BLOCK DIAGRAM

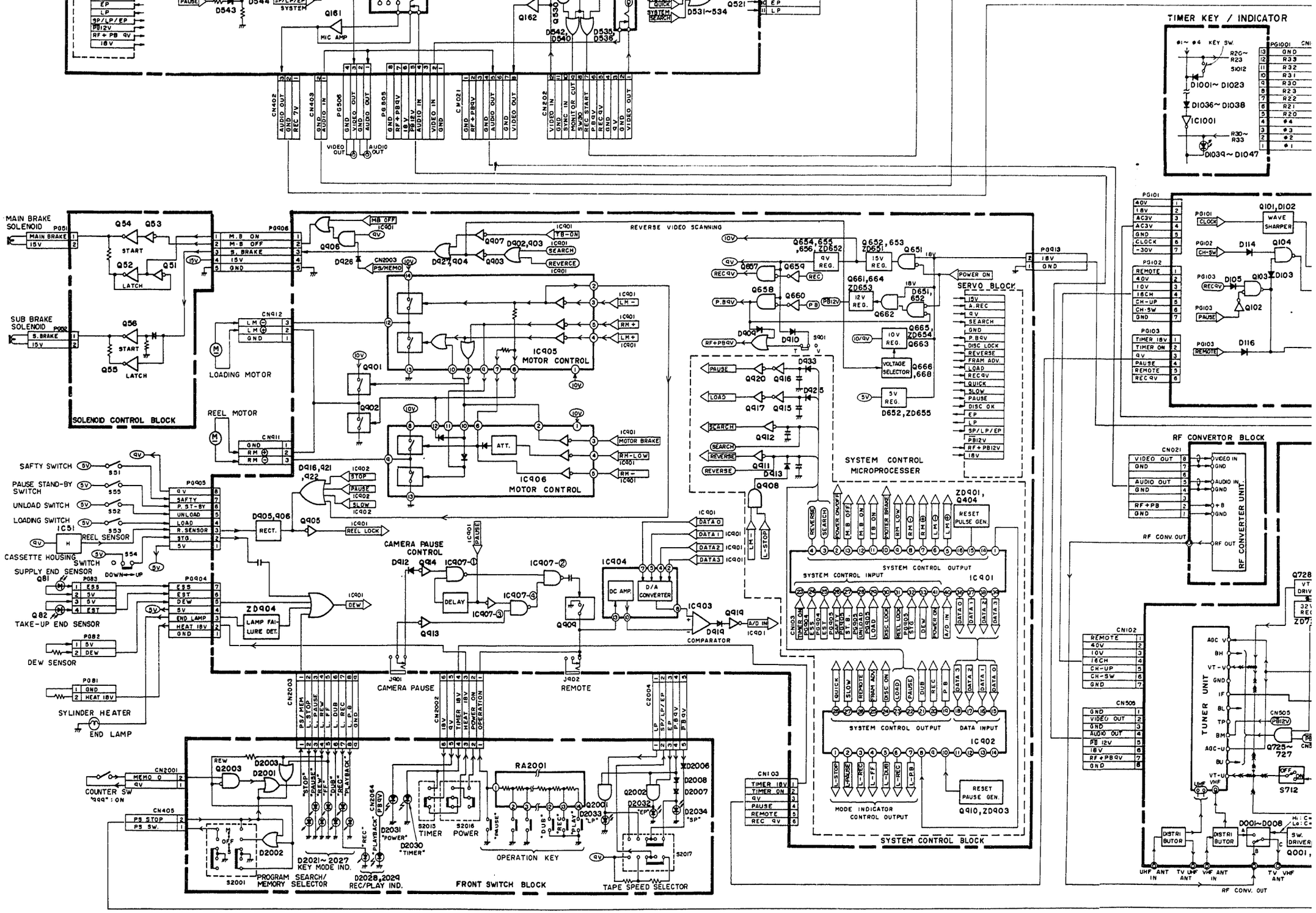



PG502
DISC OUT
GATE
FWD
REV
AMP
DRIVER
MOTOR COIL
HA11715
DFG ⊕
DFG ⊖
PG502
FG COIL
TOR BLOCK
PG501
REVERCE
PG501
DISC OUT
GATE
FWD
REV
AMP
DRIVER
HA11715
CFG ⊕
CFG ⊖
PG501
TOR BLOCK


PG202
SW30
D201
DL201
1H DELAY
PG203
DO AGC
IC201
CP205
Q215
LPF.
PRE AMP
IC 202
IC203
CH1
Q205
PRE AMP
CH SWITCH
DSA
Q209
EQ AMP
HPF LIMITER
LIMITER
FM DET.
CP203
LPF.
MAIN CONV.
CP208
3.58MHz BPF
Q219
BUFFER
CH2
Q206
PRE AMP
Q203
Q204
PEAK AMP
PLAY-Y
AGC
PLAY-C
NOIBE LIMITER
DYNAMIC DEENPH.
DE ENPH.
4.2MHz
ACC DET.
DL202
1H DELAY
VIDEO AMP
Q213
EP SW.
ADD
ACC
DO DET.
RECTI LPH
HPF DO LIM.
AGC DET.
Q202
BUFFER
CLAMP
PEAK CLIP
V/C MIX
BURST DE EMPH.
KILLER AMP
BURST EMPH. MAIN CONV. KILLER AMP
Q226
CLAMP
LPF
SP. LP.EP
PG203
LP
PG202
REC(V)
LIMITER
FM MOD.
D.W CLIP
MAIN PREEMPH.
COMPRESS
HPF
CLAMP
Q201
BUFFER
CP201
3.58MHz TRAP
MONITOR CUT
Q208
VC MIX
HPF
REC-C
REC AMP
KILLER DETECTOR
PG202
MONITOR CUT
EE VIDEO AMP
AGC AMP
Q214
BUFFER
REC-V
REC-C
CP216
4.21MHz BPF.
SUB CONVERTOR
PHASE DETECTOR (REC)
3.58MHz
3.58MHz
PHASE DETECTOR (P.B)
4PHASE LOGIC
1/4
160fh VCO
PHASE DETEC-TOR
1/160
GATE
1/2 H. SYNC
BURST GATE PULSE GEN.
VOLTAGE STV.
H SYNC
Q216
Q217
Q218
VIDEO HEAD
CH1
CH2
PG201
CH1 HEAD
CH1 HEAD
GND
GND
CH2 HEAD
CH2 HEAD
PG203
DO AGC
EP
LP
SPEED PLAY
PG202
VIDEO IN
GND
QV
GND
REC QV
PB QV
REC START
SW30
MONI CUT
SYNC CUT
GND
VIDEO OUT
PG202
PB QV
Q207
Q210
EP SW.
PG202
REC START
PG202
MONITOR OUT
Q212
Q211
QV
PG202
SYNC
PG202
SW30
Q220
D212,213
TRIGGER PULSE GEN.
Q222,223
MM
Q225
Q224
PG202
SPEED PLAY
VD PULSE GEN.
SYNC OUT
PG202
PG202
VIDEO IN
PG202
VIDEO OUT


TIMER KEY / INDICATOR
TIMER CONTROL
ø1~ ø4 KEY SW.
R20~ R23
S1012
D1001~ D1023
D1036~ D1038
IC1001
R30~ R33
D1039~ D1047
PG1001
CN1001
GND
R33
R32
R31
R30
R23
R22
R21
R20
ø4
ø3
ø2
ø1
IC102
10V
KEY INPUT
REC QV
ø4
IC 103
DISPLAY
SAT.
IC104
PG101
-30V
10V
SEGMENT
DIGIT DRIVER
KEY INPUT


AUDIO HEAD
AUDIO ERASE HEAD
PG401
A.HEAD(P)
GND
A.HEAD(R)
GND
AE. HEAD
IC401
R483
IC 402
IC 402
Q401
RL401
Q402
P.B. EQ.
Q403
Q404
P.B
REC
IC401
Q408
D401
P.B
IC401
Q407
IC402
D402
D403
PG402
AUDIO IN
GND
REC7V
PG403
AUDIO OUT
GND
PG404
P.B QV


TIMER KEY / INDICATOR
SERVO BLOCK
SYSTEM CONTROL MICROPROCESSER
SYSTEM CONTROL BLOCK
SOLENOID CONTROL BLOCK
FRONT SWITCH BLOCK
RF CONVERTOR BLOCK
RF CONVERTER UNIT
TUNER UNIT
IC905 MOTOR CONTROL
IC906 MOTOR CONTROL
CAMERA PAUSE CONTROL
REVERSE VIDEO SCANNING
MAIN BRAKE SOLENOID
SUB BRAKE SOLENOID
LOADING MOTOR
REEL MOTOR
CASSETTE HOUSING SWITCH
SUPPLY END SENSOR
TAKE-UP END SENSOR
DEW SENSOR
SYLINDER HEATER
END LAMP
COUNTER SW
PROGRAM SEARCH/ MEMORY SELECTOR
OPERATION KEY
TAPE SPEED SELECTOR
MODE INDICATOR CONTROL OUTPUT
SYSTEM CONTROL INPUT
SYSTEM CONTROL OUTPUT
DATA INPUT
RESET PULSE GEN.
CAMERA PAUSE
REMOTE
COMPARATOR
LAMP FAILURE DET.
KEY MODE IND.
REC/PLAY IND.
TIMER
POWER
SAFTY SWITCH
PAUSE STAND-BY SWITCH
UNLOAD SWITCH
LOADING SWITCH
REEL SENSOR
RECT.
REEL LOCK
DELAY
DC AMP.
D/A CONVERTER
VOLTAGE SELECTOR
RF CONV OUT
RF OUT
UHF ANT IN
TV UHF ANT
VHF ANT IN
TV VHF ANT
RF CONV. OUT

TIMER KEY / INDICATOR

TIMER CONTROL

DISPLAY

IC102

IC104

IC 103
KEY INPUT CONTROL

IC101 TIMER CONTROL

SERVO BLOCK

RF CONVERTOR BLOCK

RF CONVERTER UNIT

TUNER UNIT

CHANNEL SELECTOR

IC801

IC881

IC901

IC902

POWER SUPPLY

LINE FILTER

POWER TRANSFORMER

NOTE

CONTROL

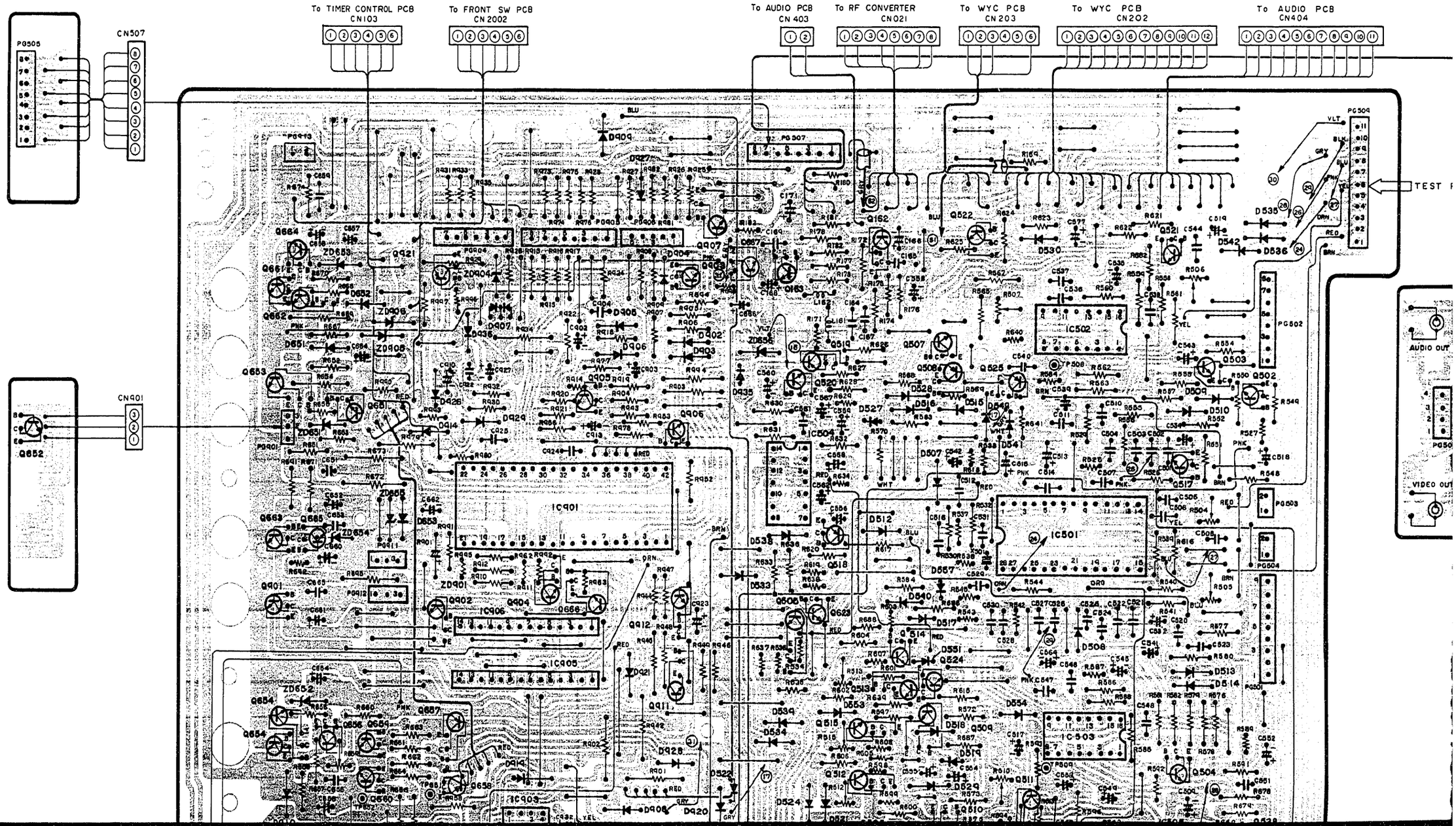
CYLINDER SERVO

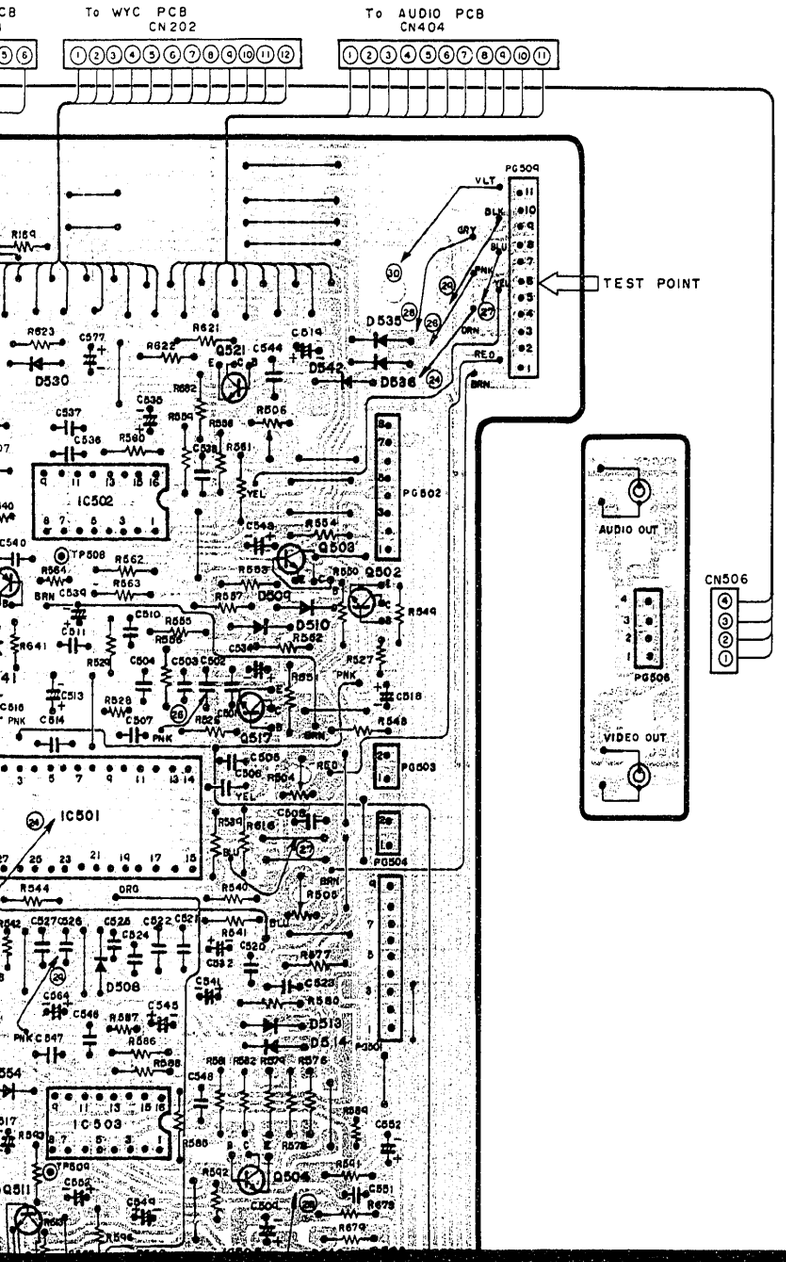
CAPSTAN SERVO

CONTROL SIG. INPUT

CONTROL SIG. OUTPUT

PSS P.C.B.(SYSTEM CONTROL & SERVO BLOCK)





CN021

1	VIDEO OUT
2	GND
3	
4	AUDIO OUT
5	GND
6	
7	RF + PB 9V
8	GND

CN013

1	TIMER 18V
2	TIMER ON
3	ALL 9V
4	PAUSE
5	REMOTE
6	REC 9V

CN202

1	VIDEO OUT
2	GND
3	ALL 9V
4	GND
5	REC 9V
6	PB 9V
7	REC START
8	SW30
9	MONI CUT
10	SYNC IN
11	GND
12	VIDEO IN

CN203

1	DO AGC IN
2	
3	EP
4	LP
5	
6	
7	SPEED PLAY

CN402

1	REC 7V
2	GND
3	AUDIO OUT

CN403

1	AUDIO IN
2	GND

CN404

1	DFG (+)
2	PB 9V
3	ALL 9V
4	GND

PG503

1	CTL
2	GND

PG504

1	DTP
2	GND

PG505

1	GND
2	VIDEO IN
3	
4	AUDIO IN
5	$\overline{PB}$ 12V
6	18V
7	RF + PB 9V
8	GND

PG903

1	GND
2	18V

PG904

1	GND
2	HEAT 18V
3	END LAMP
4	5V
5	DEW OUT
6	STAND BY SW
7	EST OUT
8	ESS OUT

PG905

1	5V
2	STAGE SW
3	REEL S. OUT
4	LOAD SW
5	UNLOAD SW
6	SAFETY SW
7	ALL 9V

PG906

1	MAIN B. ON
2	MAIN B. OFF
3	SUB B. ON
4	ALL 15V
5	GND

PG911

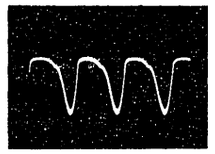
1	GND
2	REEL MOTOR
3	REEL MOTOR

PG912

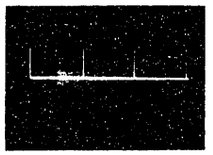
1	GND

SERVO WAVEFORMS

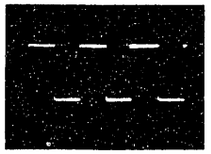
IC501 ① REC
0.2V/20μs.div.



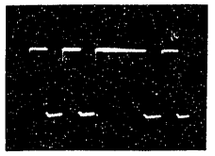
IC501 ⑩ REC
2V/10ms. div.



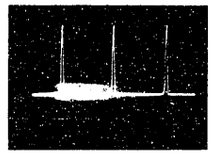
IC501 ⑯ REC
2V/10ms.div.



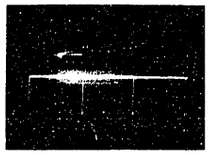
IC501 ㉓ REC
EP 0.5V/2ms.div.



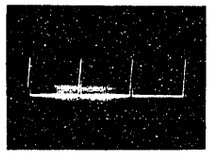
IC501 ② PB
0.5V/10μs.div.



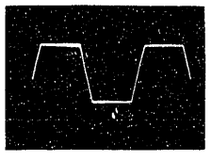
IC501 ⑪ REC
2V/10ms.div.



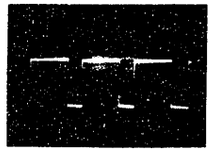
IC501 ⑰ REC
2V/10ms.div.



IC501 ㉔ REC
2V/5ms.div.



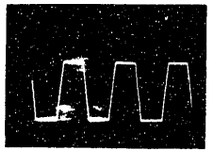
IC501 ④ REC
2V/10μs.div.



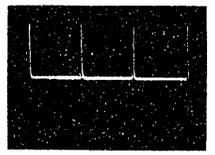
IC501 ⑪ PB
2V/10ms.div.

IC501 ⑲ REC
0.5V/10ms.div.

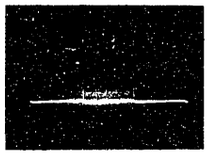
IC501 ㉔ PB
2V/10ms.div.



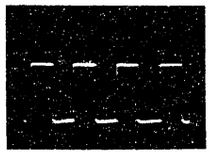
IC501 ⑧ REC
0.2V/5ms.div.



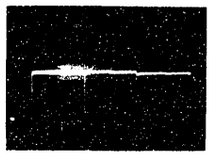
IC501 ⑫ REC
0.2/10ms.div.



IC501 ㉒ REC
SP 0.5V/2ms.div.

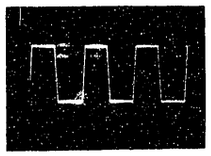


IC501 ㉕ REC
0.2V/10ms.div

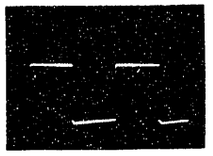


IC501 ⑩ PB
2V/10ms.div.

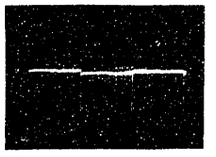
IC501 ⑭ REC
2V/10ms.div.

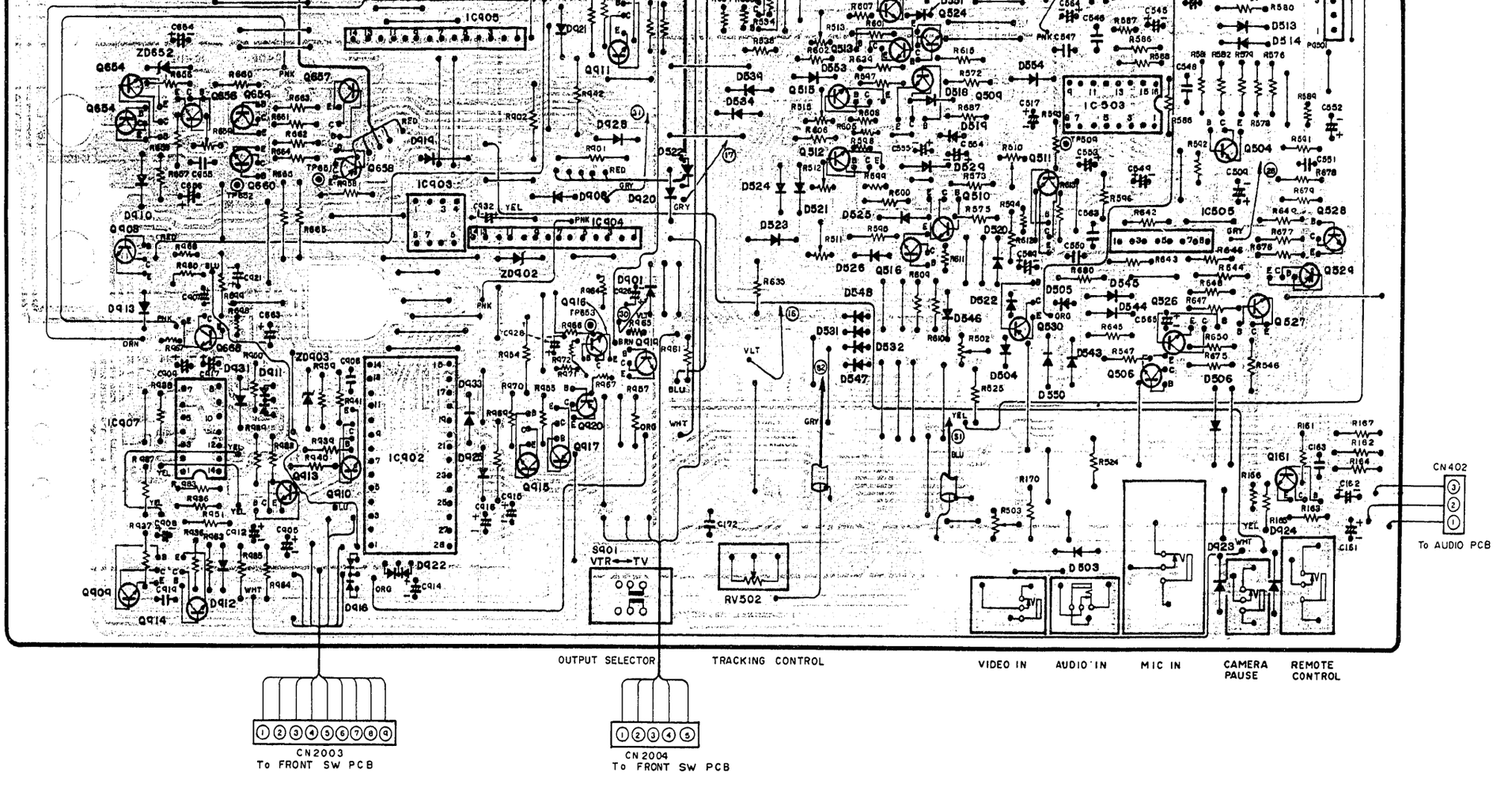


IC501 ㉒ REC
LP 0.5V/2ms.div.



IC501 ㉖ REC
0.2V/10ms.div.





Q501

	P.B
E	8.9
B	8.3
C	8.8

Q502

	P.B
E	2.2
B	2.9
C	9.5

Q503

	SEARCH
E	5.0
B	5.7
C	5.0

Q504

	SEARCH
E	5.0
B	5.7
C	5.0

Q505

	SEARCH
E	0
B	0.6
C	0.1

Q506

	SP/EP	SEARCH/PAUSE
E	0	0
B	0.1	0.1
C	3.1	0.1

Q507

	PB/REC	SEARCH FWD	SEARCH RIV
E	0	0.6	0.9
B	5	0	1.5
C	0.25	0	0.9

Q508

	PB/REC	SEARCH FWD	SEARCH RIV
E	0.25	0.6	0.9
B	0	0	2.7
C	5	0	0

Q512

	LP
E	0
B	0.6
C	0.1

Q513

	SLOW
E	0
B	0.6
C	0.1

Q514

	SEARCH
E	0
B	0.6
C	0.1

Q515

	EP
E	0
B	0.6
C	0.1

Q516

	SPEED PLAY
E	0
B	0.6
C	0.1

Q517

	P.B
E	
B	
C	9.5

Q518

	P.B
E	
B	9.5
C	

Q519

	P.B
E	9.5
B	9
C	6

Q520

	P.B
E	0
B	0
C	9.5

Q526

	P.B
E	0
B	0.6
C	0.1

Q527

	P.B
E	0
B	0.1
C	9.5

Q528

	EP
E	3.7
B	4.3
C	8

Q529

	EP
E	8.5
B	8.8
C	9.4

Q530

	P.B PAUSE
E	8
B	7.4
C	7

Q161

	P.B
E	0
B	0.7
C	1.0

Q162

	P.B
E	2.2
B	2.8
C	7.0

Q163

	P.B
E	3.4
B	4.0
C	9.5

Q651

	P.B
E	0
B	0.2
C	16.5

Q652

	P.B
E	14.8
B	15.4
C	20

Q653

	P.B
E	15.4
B	16
C	20

Q654

	P.B
E	9.5
B	10.1
C	14.8

Q655

	P.B
E	10.1
B	10.7
C	14.8

Q656

	P.B
E	0.6
B	6.6
C	10.7

Q657

	REC
E	9.5
B	8.9
C	9.5

Q658

	P.B
E	9.5
B	8.9
C	9.5

Q659

	REC
E	0
B	0.6
C	0

Q660

	P.B
E	0
B	0.6
C	0

Q661

	P.B
E	11.8
B	12.4
C	20

Q662

	P.B
E	0
B	0.6
C	0

Q663

	P.B
E	9.0
B	9.5
C	20

Q916

	STIL
E	0
B	0.6
C	0

Q917

	LOAD
E	9.5
B	8.9
C	9.0

Q920

	STIL
E	9
B	8.9
C	9.0

IC501 (REC)

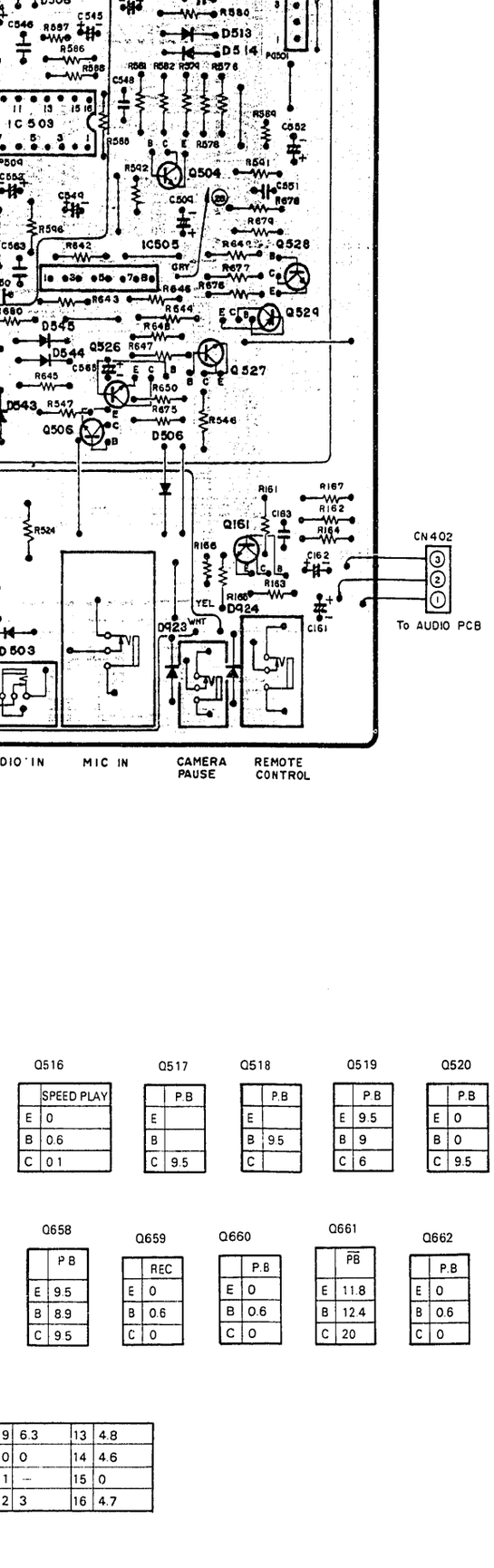
1	(0.6)	5	6.4	9	9.5	13	–	17	–	21	4.4	25	–
2	(0.7)	6	0	10	–	14	–	18	0.3	22	–	26	–
3	3.1 (0.2)	7	0	11	–	15	1.7	19	–	23	4.7	27	–
4	–	8	–	12	–	16	–	20	4.4 (8.8)	24	–	28	–

IC502

1	–	5	3	9	6.3	13	4.7
2	–	6	–	10	0	14	4.6
3	–	7	–	11	–	15	0
4	9.5	8	–	12	3	16	4.7

IC503

1	–	5	3	9	6.3	13	4.8
2	0	6	–	10	0	14	4.6
3	–	7	–	11	–	15	0
4	9.5	8	–	12	3	16	4.7



CN403

1	AUDIO IN
2	GND

CN404

1	DFG (+)
2	PB 9V
3	ALL 9V
4	GND
5	MONI CUT
6	REC 9V
7	DUB
8	SW30
9	SPEED PLAY
10	EP
11	LP

PG501

1	REVERSE
2	ALL 15V
3	CFG (−)
4	CFG (+)
5	GND
6	GND
7	HALL BIAS
8	CAPS. OUT
9	ALL 9V

PG502

1	DFG (+)
2	DFG (−)
3	GND
4	HALL BIAS
5	DISC OUT
6	ALL 9V
7	ALL 15V
8	

3	SUB B. ON
4	ALL 15V
5	GND

PG911

1	GND
2	REEL MOTOR
3	REEL MOTOR

PG912

1	GND
2	LOAD MOTOR
3	LOAD MOTOR

CN2002

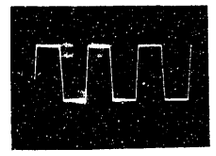
1	OPERATION
2	POWER ON
3	HEAT 18V
4	TIMER 18V
5	ALL 9V
6	18V

CN2003

1	PS/MEMO
2	LED STOP
3	LED PAUSE
4	LED REW
5	LED FF
6	LED DUB
7	LED REC
8	LED P.B
9	GND

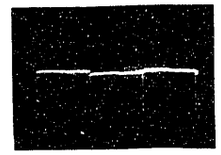
IC501 ⑩ PB
2V/10ms.div.

IC501 ⑭ REC
2V/10ms.div.

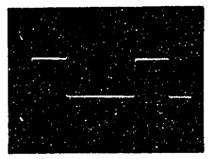


IC501 ㉒ REC
LP 0.5V/2ms.div.

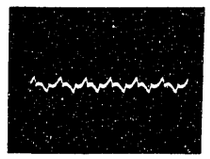
IC501 ㉖ REC
0.2V/10ms.div.



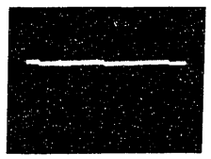
IC501 ㉗ REC
2V/5ms.div.



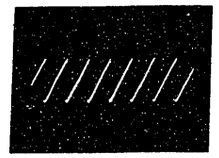
IC502 ⑤ PB/REC
50mV/5ms.div.



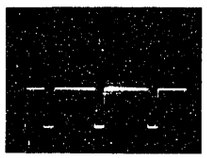
IC502 ⑫ PB/REC
50mV/2ms.div.



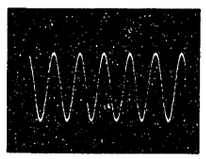
IC503 ⑪ PB/REC
2V/0.5ms.div.



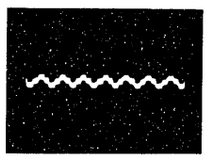
IC501 ㉗ PB
2V/10ms.div.



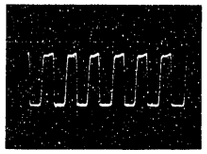
IC502 ⑥ PB/REC
100mV/5ms.div.



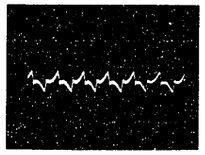
IC503 ⑤ PB/REC
50mV/1ms.div.



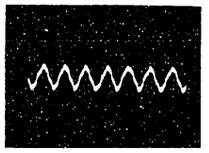
IC501 ㉘ REC
0.2V/20μs.div.



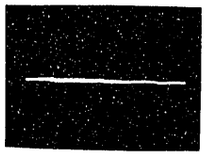
IC502 ⑦ PB/REC
50mV/5ms.div.



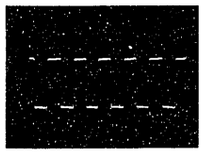
IC503 ⑥ PB/REC
50mV/1ms.div.



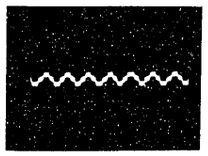
IC502 ① PB/REC
50mV/10ms.div.



IC502 ⑧ PB/REC
50mV/5ms.div.



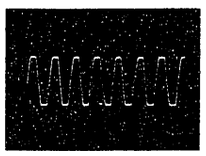
IC503 ⑦ PB/REC
50mV/1ms.div.



IC502 ③ PB/REC
50mV/5ms.div.

IC502 ⑪ PB/REC
2V/2ms.div.

IC503 ⑧ PB/REC
0.5V/ms.div.



Q516

	SPEED PLAY
E	0
B	0.6
C	0.1

Q517

	P.B
E	
B	
C	9.5

Q518

	P.B
E	
B	9.5
C	

Q519

	P.B
E	9.5
B	9
C	6

Q520

	P.B
E	0
B	0
C	9.5

Q521

	SPEED PLAY
E	0
B	0.6
C	0.7

Q522

	SPEED PLAY
E	0
B	0
C	7

Q523

	SPEED PLAY
E	0
B	0
C	7.4

Q524

	SP
E	0
B	0.6
C	0.7

Q525

	STOP
E	9
B	8.3
C	9

Q658

	P.B
E	9.5
B	8.9
C	9.5

Q659

	REC
E	0
B	0.6
C	0

Q660

	P.B
E	0
B	0.6
C	0

Q661

	$\overline{PB}$
E	11.8
B	12.4
C	20

Q662

	P.B
E	0
B	0.6
C	0

Q663

	P.B
E	9.0
B	9.5
C	20

	P.B
E	
B	
C	

Q665

	P.B
E	9.5
B	10.0
C	20

Q666

	REV.
E	0
B	0.6
C	0

Q910

	P.B
E	0
B	0.6
C	0

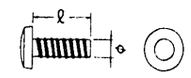
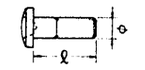
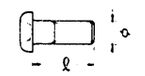
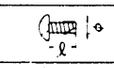
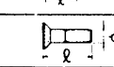
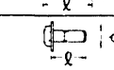
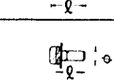
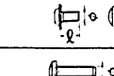
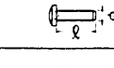
Q915

	LOAD
E	0
B	0.6
C	0

9	6.3	13	4.8
0	0	14	4.6
1	—	15	0
2	3	16	4.7

EXPLODED VIEW

REPLACEMENT SCREW KIT EP1 × 44

TYPE	Q'TY (pcs.)	DESCRIPTION	FIGURE
BT3 × 6 BT3 × 8 BT3 × 10(B) BT3 × 10	3 3 12 3	Bind head tap tight screw 3 mmϕ × 6 mm (Yellow) Bind head tap tight screw 3 mmϕ × 8 mm (Yellow) Bind head tap tight screw 3 mmϕ × 10 mm (Black) Bind head tap tight screw 3 mmϕ × 10 (Yellow)	
B3 × 6(B) B3 × 6 B3 × 8(B) B3 × 8 B3 × 14(B)	3 12 3 3 3	Bind head screw M3 mmϕ × 6 mm (Black) Bind head screw M3 mmϕ × 6 mm (Yellow) Bind head screw M3 mmϕ × 8 mm (Black) Bind head screw M3 mmϕ × 8 mm (Yellow) Bind head screw M3 mmϕ × 14 mm (Black)	
P2 × 3 P2 × 4 P2 × 5 P3 × 4 P3 × 5(B) P3 × 6 P3 × 8 P3 × 12 P4 × 6	3 3 3 3 3 3 3 3 3	Pan head screw M2 mmϕ × 3 mm Pan head screw M2 mmϕ × 4 mm Pan head screw M2 mmϕ × 5 mm Pan head screw M3 mmϕ × 4 mm Pan head screw M3 mmϕ × 5 mm (Black) Pan head screw M3 mmϕ × 6 mm Pan head screw M3 mmϕ × 8 mm Pan head screw M3 mmϕ × 12 mm Pan head screw M4 mmϕ × 6 mm	
T3 × 12	3	Tapping screw 3 mmϕ × 12 mm	
BTW3 × 10 BTW3 × 6	12 3	Bind head tap tight screw with wave washer 3 mmϕ × 10 mm Bind head tap tight screw with wave washer 3 mmϕ × 6 mm	
F3 × 6	3	Flat head screw M3 mmϕ × 6 mm	
P3 × 6(W)	3	Pan head screw with washer M3 mmϕ × 6 mm	
PSW2 × 6 PSW3 × 6 PSW3 × 8	3 3 3	Pan head screw with spring washer and flat washer M2 mmϕ × 6 mm Pan head screw with spring washer and flat washer M3 mmϕ × 6 mm Pan head screw with spring washer and flat washer M3 mmϕ × 8 mm	
PW3 × 5(B) PW3 × 6	3 3	Pan head screw with wave washer M3 mmϕ × 5 mm (Black) Pan head screw with wave washer M3 mmϕ × 6 mm	
BF3 × 6	3	Bind head with forming tap tight screw 3 mmϕ × 6 mm	
W2(L) W3(S) W5(S)	3 3 3	Washer 2 mmϕ (Large) Washer 3 mmϕ (Small) Washer 5 mmϕ (Small)	
N3 N5	3 3	Nut 3 mmϕ Nut 5 mmϕ	

Descriptive Legend for Screws

For example: P 3 × 4

Type of head — Diameter — Length

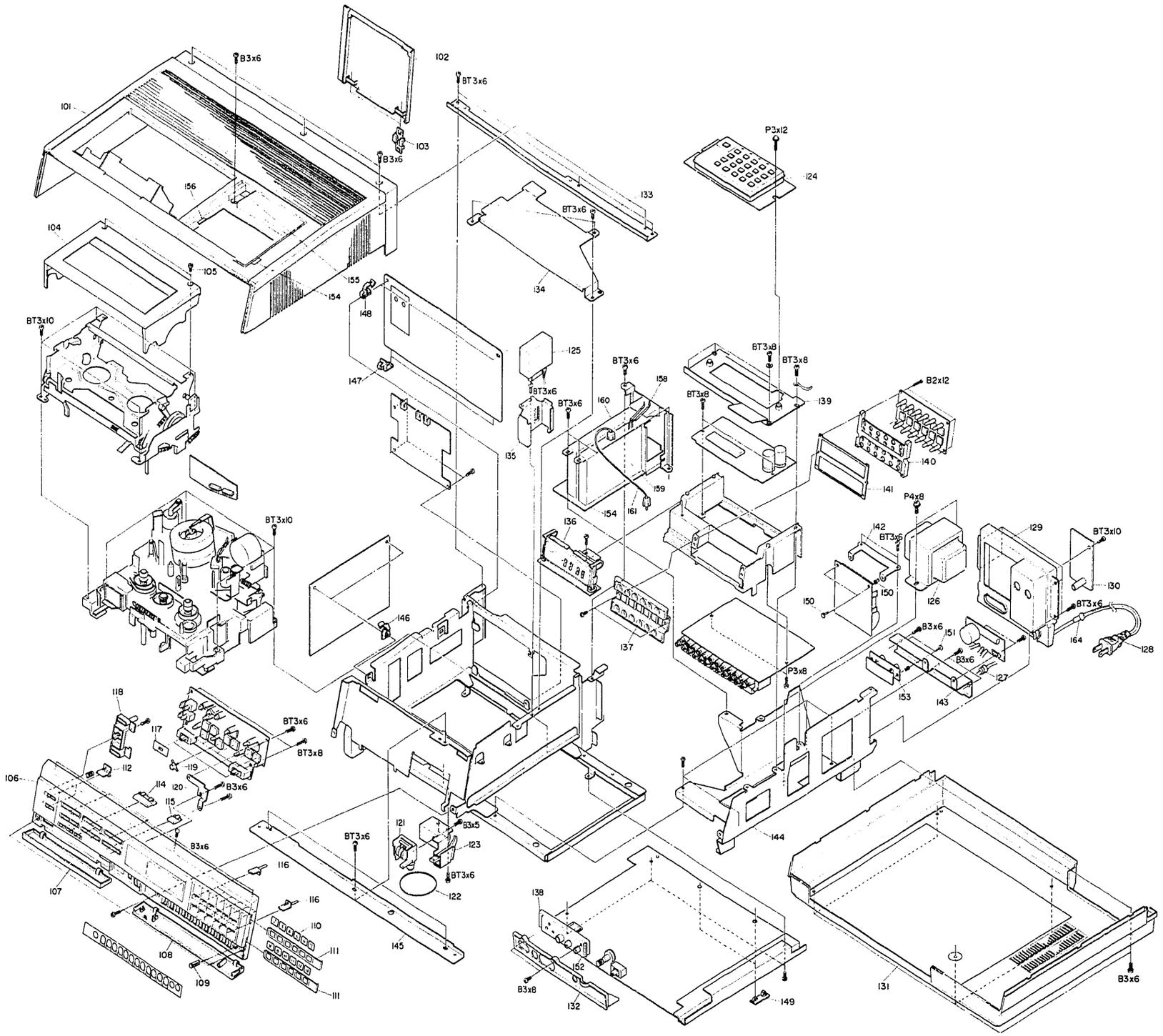
LUBRICATION

Lubrication points are shown in the disassembly diagrams by marks.

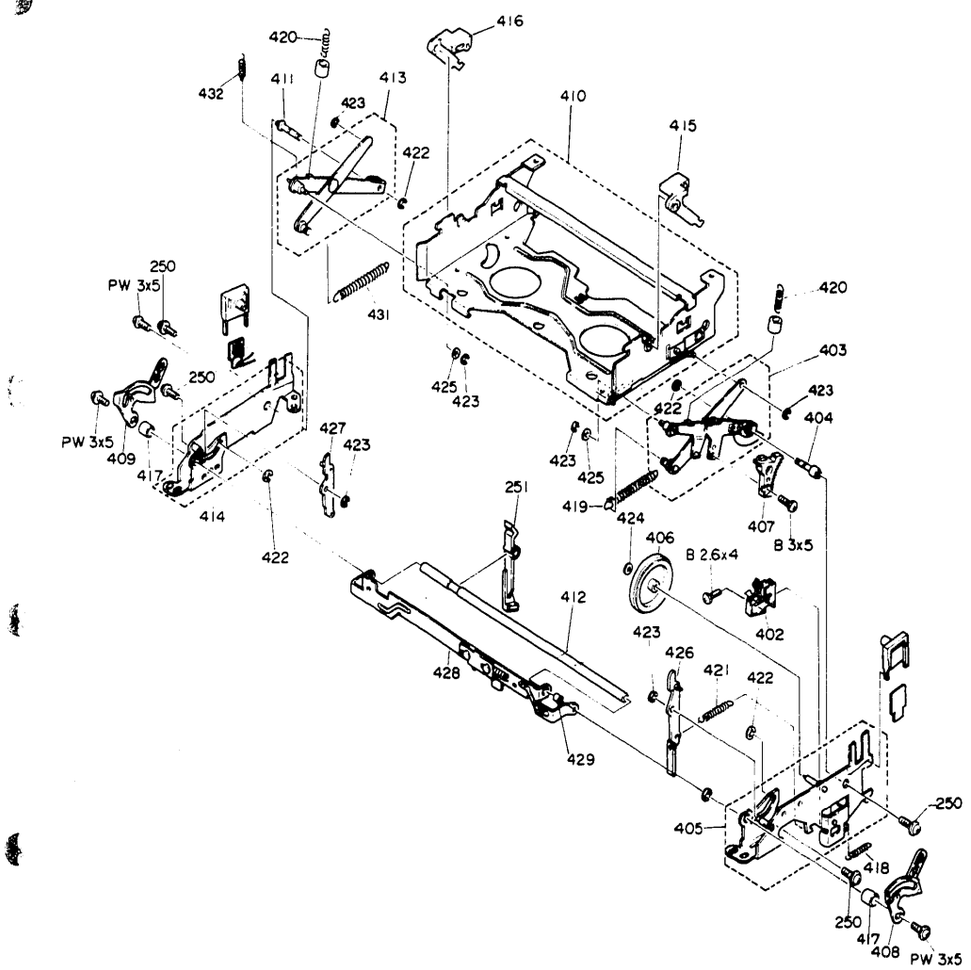
Lubrication shown in the diagram are as follows.

Ⓟ	Pan motor oil	X10W-40	Ⓗ	Hitazol	MO-138
Ⓢ	Sonic slider oil	#1600	No symbol	Froil	GB-TS-1
Ⓢi	Silicone grease	KS-64			

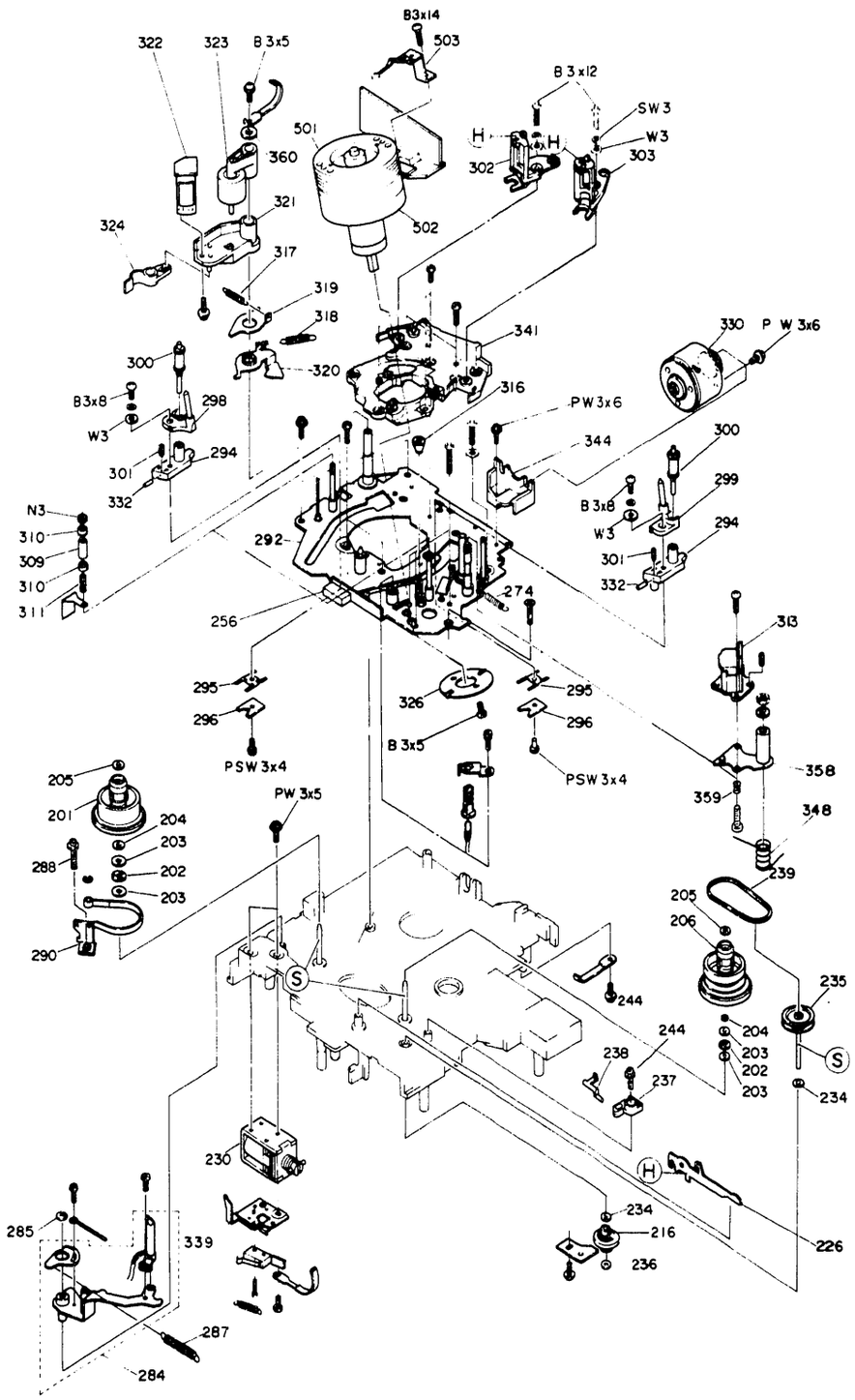
CABINET SECTION



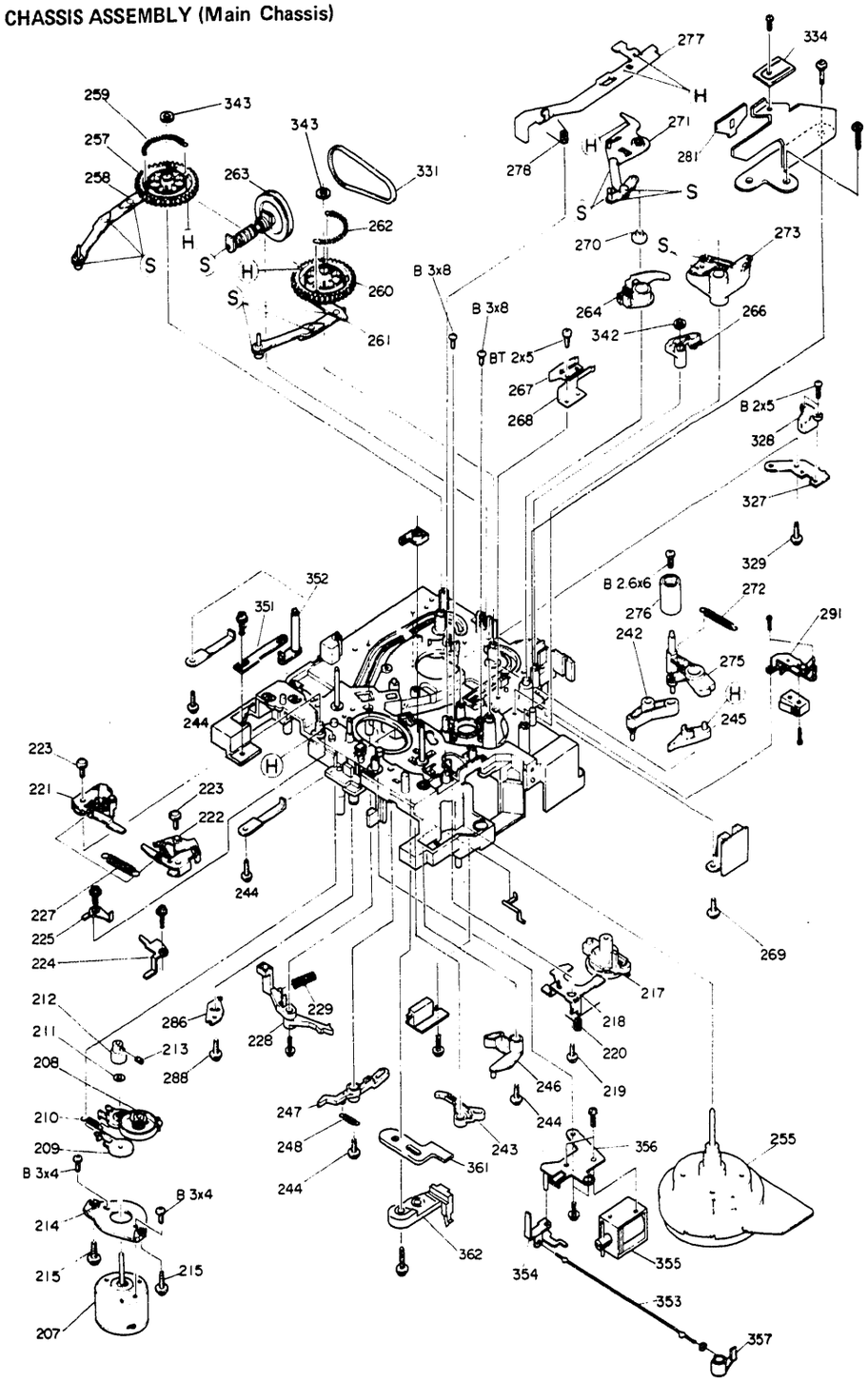
CASSETTE HOUSING SECTION



CHASSIS ASSEMBLY (Sub Chassis)



CHASSIS ASSEMBLY (Main Chassis)



REPLACEMENT PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION
		CAPACITORS
C534	0256383	TANTALUM ELECTROLYTIC 4.7MF 16V
C541	0256387	TANTALUM ELECTROLYTIC 10UF
		RESISTORS
RA2001	5068211	RESISTOR PACK R1310
RV101	5000763	VARIABLE RESISTOR 10KOHM
RV501-502	5000762	VARIABLE RESISTOR 200KOHM
R130	0170471	FUSE RESISTOR 2.20HM+-5% 1/4W
R216	5007183	SEMI VARIABLE RESISTOR 1KOHM
R232	5007185	SEMI VARIABLE RESISTOR 4.7KOHM
R460	0170472	FUSE RESISTOR 3.30HM+-5% 1/4W
R481	5007187	SEMI VARIABLE RESISTOR 22KOHM
R482	5007189	SEMI VARIABLE RESISTOR 100KOHM
R483	5007185	SEMI VARIABLE RESISTOR 4.7KOHM
R484	5007192	SEMI VARIABLE RESISTOR 470KOHM
R491	0170481	FUSE RESISTOR 220HM+-5% 1/4W
R502	5007225	SEMI VARIABLE 22KOHM
R503	5007191	SEMI VARIABLE RESISTOR 220KOHM
R504-505	5007187	SEMI VARIABLE RESISTOR 22KOHM
R506	5007186	SEMI VARIABLE RESISTOR 10KOHM
R507	5007226	SEMI VARIABLE 47KOHM
R510	5007189	SEMI VARIABLE RESISTOR 100KOHM
R511	5007186	SEMI VARIABLE RESISTOR 10KOHM
R512	5007187	SEMI VARIABLE RESISTOR 22KOHM
R513	5007189	SEMI VARIABLE RESISTOR 100KOHM
R515	5007188	SEMI VARIABLE RESISTOR 47KOHM
R659	5007183	SEMI VARIABLE RESISTOR 1KOHM
R711A-711L	5008651	PRE-SET VARIABLE RESISTOR
		SEMI-CONDUCTORS
D 51	5330104	RECTIFIER V06A
D 52	5330104	RECTIFIER V06A
D 53	5330574	DIODE 1S2473
D102	5330573	DIODE 1S2473
D103	5330573	DIODE 1S2473
D104-107	5330573	DIODE 1S2473
D111-117	5330573	DIODE 1S2473
D118-119	5331511	DIODE DAN201
D120	5330573	DIODE 1S2473
D121	5330101	RECTIFIER V06C
D151-154	5330101	RECTIFIER V06C
D155	5331102	DIODE MAB-21-22
D2001-2003	5331511	DIODE DAN201
D2005-2008	5330131	DIODE 1S2076
D201-202	5330131	DIODE 1S2076

SYMBOL-NO	P-NO	DESCRIPTION
		SEMI-CONDUCTORS
D2021	5380271	LED GL-9PR2
D2022-2025	5380301	LED GL4PR2
D2026-2027	5380271	LED GL-9PR2
D2028	5380481	LED SLR-53CC1
D2029	5380482	LED SLR53URC1
D2030-2034	5380301	LED GL4PR2
D204-206	5330131	DIODE 1S2076
D207	0575005	DIODE 1N60
D208-215	5330131	DIODE 1S2076
D401-402	5330131	DIODE 1S2076
D403	5331511	DIODE DAN201
D404	5330671	DIODE 1N34A
D405-408	5330131	DIODE 1S2076
D410-411	5331511	DIODE DAN201
D412-414	5330131	DIODE 1S2076
D501-508	5330573	DIODE 1S2473
D510	5330573	DIODE 1S2473
D512-513	5330573	DIODE 1S2473
D515	5330573	DIODE 1S2473
D517-525	5330573	DIODE 1S2473
D526-528	5330573	DIODE 1S2473
D529-530	5330573	DIODE 1S2473
D531-532	5330573	DIODE 1S2473
D533-537	5330573	DIODE 1S2473
D539-548	5330573	DIODE 1S2473
D550-554	5330573	DIODE 1S2473
D651-653	5330573	DIODE 1S2473
D701A-701L	5330131	DIODE 1S2076
D702A-702L	5380561	LED SR503D
D711A-711L	5330131	DIODE 1S2076
D712A-712L	5330131	DIODE 1S2076
D723-725	5330573	DIODE 1S2473
D901-906	5330573	DIODE 1S2473
D907	5331511	DIODE DAN201
D908-910	5330573	DIODE 1S2473
D911	5331511	DIODE DAN201
D912	5330573	DIODE 1S2473
D913	5330573	DIODE 1S2473
D914	5330573	DIODE 1S2473
D916	5331511	DIODE DAN201
D919	5330573	DIODE 1S2473
D920-921	5330573	DIODE 1S2473
D922	5331511	DIODE DAN201
D923-929	5330573	DIODE 1S2473
D931	5330573	DIODE 1S2473
D933-934	5330573	DIODE 1S2473
D935	5330573	DIODE 1S2473

SYMBOL-NO	P-NO	DESCRIPTION
		SEMI-CONDUCTORS
D936	5330573	DIODE 1S2473
IC 51	5391031	HALL ELEMENT DN6838
IC101	5359776	IC HD38630A26
IC102	5358281	IC TA4181
IC103	5358291	IC TA4182
IC104	5357181	IC TA4123
IC201	5358551	MODULE HT4204
IC202	5358561	MODULE HT4205
IC203	5358571	MODULE HT4206
IC401	5350211	IC HA1319
IC402	5359901	IC UPD4066C
IC403	5350251	IC HA1406
IC481	5352111	IC HA11714
IC482	5352121	IC HA11715
IC501	5356842	IC HA11711
IC502-503	5352101	IC HA11713
IC504	5359501	IC MPD4011C
IC505	5352261	IC HA11721
IC721	5351721	IC MPC1363C
IC901	5365551	IC HD44801A05
IC902	5365581	IC HD38701A08
IC903	5350603	IC NJM4558BM
IC904	5356161	IC TA4168
IC905	5358401	IC TA4194
IC906	5358301	IC TA4193
IC907	5359501	IC MPD4011C
Q 51	5320593	TRANSISTOR 2SA673C
Q 52	5322213	TRANSISTOR 2SC1741R
Q 53	5321662	TRANSISTOR 2SC2021S
Q 54	5321213	TRANSISTOR 2SD468C
Q 55	5322213	TRANSISTOR 2SC1741R
Q 56	5322751	TRANSISTOR 2SD836
Q 81	5380471	PHOTO TRANSISTOR PN150TV
Q 82	5380471	PHOTO TRANSISTOR PN150TV
Q101-107	5321661	TRANSISTOR 2SC2021R
Q108	5321213	TRANSISTOR 2SD468C
Q109-110	5321661	TRANSISTOR 2SC2021R
Q161-162	5321662	TRANSISTOR 2SC2021S
Q163	5320613	TRANSISTOR 2SC1213C
Q2001-2003	5321661	TRANSISTOR 2SC2021R
Q201-202	5321252	2SA844D
Q203-211	5321662	TRANSISTOR 2SC2021S
Q212	5321252	2SA844D
Q213-216	5321662	TRANSISTOR 2SC2021S
Q217	5320593	TRANSISTOR 2SA673C
Q218-220	5321662	TRANSISTOR 2SC2021S
Q222-224	5321662	TRANSISTOR 2SC2021S

SYMBOL-NO	P-NO	DESCRIPTION
		SEMI-CONDUCTORS
Q225	5321252	2SA844D
Q226	5321662	TRANSISTOR 2SC2021S
Q401-412	5321662	TRANSISTOR 2SC2021S
Q413	5321502	TRANSISTOR 2SK68-M
Q414-415	5321662	TRANSISTOR 2SC2021S
Q416	5321213	TRANSISTOR 2SD468C
Q417-423	5321662	TRANSISTOR 2SC2021S
Q501	5321672	TRANSISTOR 2SA786R
Q502	5320613	TRANSISTOR 2SC1213C
Q503-507	5321662	TRANSISTOR 2SC2021S
Q508	5321252	2SA844D
Q509-510	5321662	TRANSISTOR 2SC2021S
Q511	5321662	TRANSISTOR 2SC2021S
Q512-517	5321662	TRANSISTOR 2SC2021S
Q518-519	5321252	2SA844D
Q520-524	5321662	TRANSISTOR 2SC2021S
Q525	5321252	2SA844D
Q526-528	5321662	TRANSISTOR 2SC2021S
Q529-530	5321252	2SA844D
Q651	5321662	TRANSISTOR 2SC2021S
Q652	5321301	TRANSISTOR 2SC1061
Q653	5320613	TRANSISTOR 2SC1213C
Q654	5321301	TRANSISTOR 2SC1061
Q655	5320613	TRANSISTOR 2SC1213C
Q656	5321662	TRANSISTOR 2SC2021S
Q657-658	5322731	TRANSISTOR 2SA952M
Q659-660	5321662	TRANSISTOR 2SC2021S
Q661	5321301	TRANSISTOR 2SC1061
Q662	5321662	TRANSISTOR 2SC2021S
Q663	5321301	TRANSISTOR 2SC1061
Q664-665	5320613	TRANSISTOR 2SC1213C
Q666	5321662	TRANSISTOR 2SC2021S
Q667	5320613	TRANSISTOR 2SC1213C
Q668	5321293	TRANSISTOR 2SC1740LN-R
Q721-723	5321661	TRANSISTOR 2SC2021R
Q724	5321252	2SA844D
Q725-727	5320593	TRANSISTOR 2SA673C
Q728	5320613	TRANSISTOR 2SC1213C
Q729-732	5321661	TRANSISTOR 2SC2021R
Q733	5320593	TRANSISTOR 2SA673C
Q901	5321301	TRANSISTOR 2SC1061
Q902	5320643	TRANSISTOR SILICON 2SC1162
Q903-907	5321662	TRANSISTOR 2SC2021S
Q908	5321293	TRANSISTOR 2SC1740LN-R
Q909-916	5321662	TRANSISTOR 2SC2021S
Q917	5321672	TRANSISTOR 2SA786R
Q919	5321662	TRANSISTOR 2SC2021S

SYMBOL-NO	P-NO	DESCRIPTION
		SEMI-CONDUCTORS
Q920-921	5321672	TRANSISTOR 2SA786R
ZD101	5330392	ZENER DIODE HZ6B
ZD102	5330313	DIODE HZ7C
ZD103	5330553	ZENNER DIODE HZ11C
ZD651	5330562	DIODE HZ16-2
ZD652	5330393	ZENER DIODE HZ6C
ZD653	5330532	DIODE HZ-12B
ZD654	5330556	ZENNER DIODE HZ11A2
ZD655	5330841	ZENNER DIODE RD5.1E-B
ZD656	5330556	ZENNER DIODE HZ11A2
ZD721	5350611	IC UPC574J
ZD722	5330553	ZENNER DIODE HZ11C
ZD901	5330556	ZENNER DIODE HZ11A2
ZD902-903	5330393	ZENER DIODE HZ6C
ZD904	5330556	ZENNER DIODE HZ11A2
ZD905-906	5330841	ZENNER DIODE RL5.1E-B
		TRANSFORMERS
T401	5260366	BIAS COIL
		COILS
L151	5270241	LINE FILTER
L161	5152066	CHOKE COIL 82MICROH
L162	5152027	CHOKE COIL
L201	5152087	PEAKING COIL 100MICROH
L203-204	5152073	CHOKE COIL 6.2MICROH
L204	5152087	PEAKING COIL 100MICROH
L205	5152081	CHOKE 3.3MICROH
L206	5152092	PEAKING COIL 220MICROH
L207	5152081	CHOKE 3.3MICROH
L208	5152087	PEAKING COIL 100MICROH
L209	5152092	PEAKING COIL 220MICROH
L210	5152087	PEAKING COIL 100MICROH
L211	5152078	CHOKE COIL 22MH
L213	5152086	CHOKE COIL 82MICROH
L214-216	5152087	PEAKING COIL 100MICROH
L218-219	5152087	PEAKING COIL 100MICROH
L220	5152099	CHOKE COIL 820UH+-10%
L221	5152083	CHOKE COIL
L222-224	5152087	PEAKING COIL 100MICROH
L225	5152081	CHOKE 3.3MICROH
L401	5150362	CHOKE COIL
L402	5150366	CHOKE COIL 15 MH
L403	5260215	TRAP COIL 33MH
L404	5152075	CHOKE COIL 12MH
L405	5150573	CHOKE COIL

SYMBOL-NO	P-NO	DESCRIPTION
		COILS
L491	5152099	CHOKE COIL 820UH+-10%
		CRYSTALS
X501	5780492	CRYSTAL
		MISCELLANEOUS
	5310451	TIMER DISPLAY
	5762281	LAMP
	6762171	SPACER FOR LED (PAUSE.DUB.REW.FF)
	6762181	SPACER FOR LED (REC.PLAY.STOP)
	6762191	SPACER FOR LED (CHANNEL PRESET)
	6860481	SPACER FOR LED (EP.LP.SP)
	6860491	SPACER FOR LED (POWER.TIMER)
CP201	5123031	TRAP FILTER
CP202	5123032	COIL
CP203	5162032	DELAY LINE
CP204	5162031	LOW PASS FILTER
CP205	5162033	LOW PASS FILTER
CP206	5162041	BAND PASS FILTER
CP207	5162033	LOW PASS FILTER
CP208	5162042	BAND PASS FILTER
CP209	5161953	HIGH PASS FILTER
DL201	5785032	1-H DELAY LINE
DL202	5785052	DELAY LINE
FU151	5720081	FUSE 1A
FU152	5720243	FUSE
RL401-402	5641204	RELAY
S 51	5601166	PUSH SWITCH
S 52	5601165	SWITCH
S 53	5601165	SWITCH
S 54	5633362	PUSH SWITCH
S 55	5601165	SWITCH
S2001	5624251	SLIDE SWITCH
S2002	5633351	PUSH SWITCH
S2004-2014	5633351	PUSH SWITCH
S2015-2018	5633621	PUSH SWITCH
S2017	5624251	SLIDE SWITCH
S701A-701L	5633352	PUSH SWITCH
S712	5633362	PUSH SWITCH
S901	5623551	SLIDE SWITCH
		FOR FINAL ASSEMBLY
101	~~6104137~~ 6104133	TOP CASE (USA)
101	6104138	TOP CASE (CANADA)
102	6172384	TIME SET COVER
103	6337411	HINGE TIMER PANEL
104	6092951	CASSETTE LID

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
105	7547741	SPECIAL SCREW
106	6224082	FRONT PANEL ASSEMBLY
107	6174031	SWITCH DOOR
108	6860843	CHANNEL PLATE DOOR
109	6860541	SWITCH PIECE
110	6465152	CHANNEL CARD
111	6860513	CHANNEL CARD HOLDER
112	6053571	BUTTON
113		BUTTON
114		BUTTON
115		BUTTON
119	6762201	SWITCH CAP
121	5559343	TAPE COUNTER
122	6354241	COUNTER BELT
123	6860773	EJECT LEVER (EJECT KA03)
124	5639392	PROGRAM BOARD ASSEMBLY
125	5585602	RF CONVERTER
126	5212565	POWER TRANSFORMER (USA)
126	5212567	POWER TRANSFORMER (CANADA)
127	6794091	RUBBER BUSH
128	5746491	POWER CORD
129	6860613	REAR PLATE PANEL
130	6173623	BURSTER COVER
131	6035634	BOTTOM COVER
132	6860732	FRONT JACK COVER
136	6860471	TIMER HOLDER
137	6860531	CHANNEL LED GUIDE
140	6860502	P.C.B HOLDER
149	6860631	P.C.B HOLDER
148	6860641	P.C.B HOLDER
149	6860661	HINGE (P.C.B)
150	6795191	RIVET
151	6795151	RIVET
152	5679711	FRONT JACK PLATE
153	5679721	REAR JACK PLATE
157		HINGE (BUTTON)
158	7084072	VTR FRONT END ASSEMBLY
201	6413633	SUPPLY REEL TABLE ASSEMBLY
202	6750441	RETAINER
203	7787031	THRUST SUPPORT
204	7786216	POLYSLIDER WASHER
205	7778859	POLYSLIDER WASHER
206	6413654	TAKE-UP REEL TABLE ASSEMBLY
207	5576417	REEL MOTOR
208	6413663	FF/REW IDLER
209	6755521	FF/REW IDLER BASE
210	6324436	SPRING

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
211	7786178	POLE-SLIDER WASHER
212	6383551	FF/REW PULLEY
213	7773084	SCREW
214	6755573	MOTOR HOLDER
215	7781132	BT SCREW
216	6421932	MAGNET PULLEY
217	6414221	PLAY IDLER ASSEMBLY
219	7781133	BT SCREW-3MMC
220	6545582	SPRING
221	7318322	BRAKE ARM (LEFT)
222	7318332	BRAKE ARM (RIGHT)
223	7781135	BT SCREW-3MMC
224	7371042	BRAKE LEVER
225	7371031	BRAKE ARM
226	7371052	SOLENOID SLIDER
227	6302491	SPRING
228	6755502	SUB BRAKE (SUPPLY)
229	6305412	SPRING
230	5642804	DC SOLENOID
235	6421902	PULLEY
236	7778859	POLYSLIDER WASHER
237	6860701	TAKE-UP SOLENOID ARM
238	6756522	REEL HOOK ARM
239	6354401	BELT
242	6860241	CONNECT ARM
243	6755471	NEUTRAL ARM
244	7781133	BT SCREW-3MMD
245	6755542	PLAY ARM
246	6756241	EJECT INHIBITING ARM (1)
247	6756251	EJECT INHIBITING ARM (2)
248	6540611	SPRING
250	R660405	PW SCREW-3MMLx5MM
251	6860162	RECORDING PREVENTION ARM
255	5576743	DD CAPSTAN MOTOR
256	7677368	CUSHION
257	6430421	LOADING GEAR (LEFT)
258	7318352	3 SERIES LINK
259	6302344	SPRING
260	6430422	LOADING GEAR (RIGHT)
261	7318352	3 SERIES LINK
262	6302344	SPRING
263	6413671	LOADING WORM
264	6762241	SWITCH ARM (LOADING)
266	6755613	SWITCH ARM (UNLOADING)
267	6540542	SWITCH ARM STOPPER (LOADING)
268	6540552	SWITCH ARM STOPPER (UNLOADING)
269	7781133	BT SCREW-3MMD

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
270	6343473	ROLLER
271	7318376	PRESSURE ROLLER LINK
272	6301655	SPRING
273	6755671	SPRING
274	6540561	SPRING
275	6860212	PRESSURE ROLLER ARM
276	6383213	PRESSURE ROLLER ASSEMBLY
277	7318461	LOADING SLIDER
278	6545592	SPRING
281	6532921	CASSETTE OPENER
283	7781133	BT SCREW-3MMD
284	7041821	TENSION ARM (WITH CUE HEAD)
287	6301394	SPRING FOR DAMPER ARM
288	7781133	BT SCREW-3MMD
290	7318382	TENSION BAND
294	6977091	GUIDE POLLER BASE
295	6532911	SPRING
296	7317942	LIMIT PLATE
298	6973461	TILT POLE (SUPPLY)
299	6973471	TILT POLE(TAKE-UP)
300	6344252	GUIDE ROLLER SHAFT
301	7773087	SET SCREW
302	6977021	CATCHER (TAKE-UP)
303	6977011	CATCHER (SUPPLY)
309	7575242	TAPE GUIDE
310	7543831	GUIDE FRAME
311	6304903	SPRING
313	5448461	AUDIO CONTROL HEAD
316	7549271	X-ADJUST SCREW
317	6323073	SPRING
318	6322211	PRESSURE ROLLER ARM SPRING
319	7320402	IMPEDANCE OPERATING ARM (2)
320	7370422	IMPEDANCE OPERATING ARM(1)
321	6860171	HEAD ARM
322	5448371	FULL ERASE HEAD
323	6383526	IMPEDANCE ARM
326	7060952	MG PLATE
328	5445193	HEAD
330	5576351	LOADING MOTOR
331	6354921	BELT-LOADING
334	0170309	DEW SENSOR
339	7330917	BRACKET
341	6977031	CYLINDER BASE
342	7787601	WASHER
343	7787602	WASHER
344	6860261	MOTOR HOLDER
348	6546161	SPRING

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
351	7370872	PLATE
352	6860412	LEVER
353	7548781	WIRE
354	7370062	LEVER
355	5642801	DC SOLENOID
356	7370823	SOLENOID BASE
357	6860722	ARM
358	7370371	ACE HEAD BASE
359	6304901	SPRING
360	0626575	WASHER
361	7371451	SLIDER
362	6860711	HOLDER
402	6347261	GOVERNER
403	7318263	HOLDER LINK
404	7546961	SHAFT
405	7318884	HOLDER BRACKET (RIGHT)
406	6381954	DUMPER WHEEL
407	6430391	RACK GEAR
408	7318403	SYNCHRO ARM
409	7318402	SYNCHRO ARM
410	7318485	CASSETTE UP ASSEMBLY
411	7546981	SHAFT
412	7546971	SHAFT
413	7318293	HOLDER LINK (LEFT)
414	7318873	HOLDER BRACKET (LEFT)
415	6755742	PRESSURE ARM (RIGHT)
416	6755752	PRESSURE ARM (LEFT)
417	7575253	SPACER
418	6300147	SPRING
419	6540671	SPRING
420	6540662	SPRING
421	6300111	SPRING
422	7230902	E RING
423	7230901	E RING
424	7778659	POLYSLIDER WASHER
425	7787411	WASHER
426	7316301	LOCK ARM (RIGHT)
427	7318303	LOCK ARM (LEFT)
429	6755531	SPACER RING
431	6540673	SPRING
501	5458163	UPPER CYLINDER
502	5458254	LOWER CYLINDER ASSEMBLY
503	5687401	BRUSH

SYMBOL-NO	P-NO	DESCRIPTION
		FOR ACCESSARIES
	5639413	REMOTE CONTROL BOX
	5661231	PLUG
	5679541	ANTENNA ADAPTOR(300OHM-75OHM)
	5679591	MATCHING CONNECTER
	5893171	FEEDER CABLE
	5896761	CABLE
	6180181	DUST COVER
	6860562	CHANNEL ADJUST DRIVER

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